Vol. 940 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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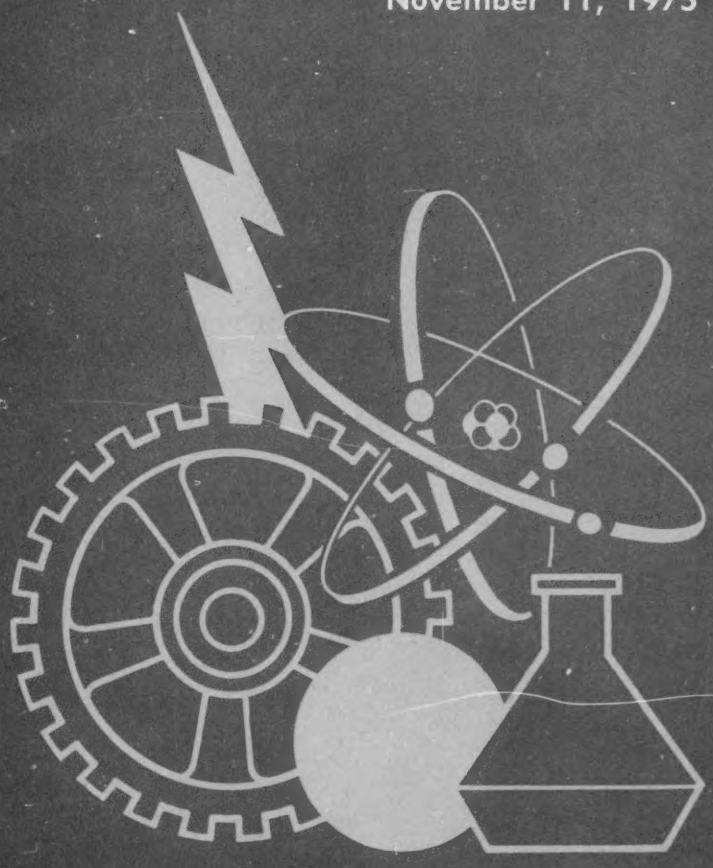
PATENTS

November 11, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

November 11, 1975 Volume 940 Number 2

CONTENTS

	Page
Patent and Trademark Notices	
Interference Practice	570
Removal from Register	570
Patent Notices	
Certificates of Correction for the Week of November 11, 1975	571
Erratum	571
Disclaimers	571
Dedications	571
Condition of Patent Applications	572
Reissue Patents Granted (28,608)	573
Plant Patents Granted (3,801)	575
Patents Granted	
General and Mechanical (3,918,096)	577
Chemical (3,918,895)	838
Electrical (3,919,454)	986
Design Patents Granted (237,557)	1077
Index of Patentees	PI 1
Cross Reference of Published Patent Applications Pubilshed Under Trial Voluntary Protest Program	PI 50
Indices of Applicants of Reissues, Plants and Designs	PI 52
Classification of	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs and Plants	PI 62

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PATENT AND TRADEMARK OFFICE NOTICES

Interference Practice

Settlement Agreements

Inquiries by attorneys have been made from time to time at the Board of Patent Interferences as to why the Commissioner does not give notice to the parties or their attorneys of record, a reasonable time prior to termination of an interference, of the requirement relative to the filing of settlement agreements, citing 35 USC 135(c), second paragraph.

Attention is called to the fact that notice is given in the second full paragraph of Form POL–76, the letter to the parties advising them of the declaration of the interference.

WALTER A. MODANCE,
Oct. 15, 1975. *Chairman, Board of Patent Interferences.*

Removal From Register

Pursuant to the provisions of 37 C.F.R. 1.347, a letter was directed on August 15, 1975, to Mr. John A. Duffy at California Computer Products Corp., 2411 W. La Palma Avenue, Anaheim, California 92801, the last post office address furnished by him to the Committee on Enrollment. No reply was received within the period of thirty days therein set. Accordingly, his name is being removed from the Register of Attorneys.

LUTRELLE F. PARKER,
Oct. 14, 1975. *Chairman, Committee on Enrollment.*

Certificates of Correction for the Week of Nov. 11, 1975

Re. 28,400	3,855,023	3,880,997	3,891,629
Re. 28,420	3,858,158	3,881,092	3,892,881
Re. 28,424	3,859,362	3,881,104	3,893,174
D. 235,623	3,861,079	3,881,614	3,893,453
D. 236,002	3,861,577	3,881,833	3,893,535
3,568,973	3,862,663	3,881,857	3,894,077
3,588,324	3,863,033	3,882,284	3,894,851
3,628,207	3,864,135	3,883,414	3,894,918
3,688,050	3,864,346	3,883,455	3,895,021
3,714,901	3,864,490	3,883,860	3,896,014
3,734,638	3,867,700	3,883,871	3,896,621
3,740,169	3,868,490	3,883,964	3,896,807
3,745,178	3,869,211	3,884,051	3,897,073
3,748,198	3,869,843	3,885,480	3,897,134
3,753,992	3,870,626	3,885,676	3,897,183
3,762,281	3,870,764	3,885,977	3,897,249
3,776,325	3,871,272	3,886,358	3,897,270
3,781,708	3,871,459	3,886,912	3,897,412
3,808,292	3,874,152	3,887,009	3,897,444
3,821,131	3,875,171	3,887,676	3,898,211
3,823,598	3,876,074	3,888,246	3,898,212
3,826,219	3,876,897	3,888,802	3,898,340
3,826,263	3,876,950	3,889,172	3,898,349
3,829,868	3,878,463	3,889,638	3,898,786
3,839,067	3,879,144	3,889,768	3,898,846
3,840,540	3,879,549	3,889,979	3,899,594
3,845,169	3,879,784	3,890,107	3,900,321
3,851,187	3,879,918	3,890,143	3,900,673
3,851,742	3,880,267	3,890,261	3,900,683
3,852,832	3,880,284	3,890,501	3,901,070
3,853,361	3,880,435	3,890,721	3,901,800
3,853,919	3,880,692	3,891,412	3,901,932
3,854,241	3,880,757	3,891,428	

Erratum

All reference to Patent No. 3,915,690 to Joel Muzik et al. of New Jersey for "Composition and Method of Making Alloy Steel Powder" appearing in the OFFICIAL GAZETTE of October 28, 1975, should be deleted since no patent was granted.

Disclaimers

Re. 27,637.—*William J. Roach*, Foster City, Calif. PIPETTING SYSTEM. Patent dated May 8, 1973. Disclaimer filed Sept. 11, 1975, by the assignee, *Oxford Laboratories Inc.*

Hereby enters this disclaimer to claims 11, 12 and 16–18 of said patent.

3,287,136.—*Clarence E. McBride*, Rochester, N.Y. LIGHT-DEVELOPABLE SILVER HALIDE EMULSIONS. Patent dated Nov. 22, 1966. Disclaimer filed Sept. 9, 1975, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to all claims of said patent.

3,419,868.—*Lorimer Clayton, Jr.*, Atlanta, Ga. AUTOMATIC TRACKING SYSTEM UTILIZING CODED SCAN SEQUENCE. Patent dated Dec. 31, 1968. Disclaimer filed Aug. 18, 1975, by the assignee, *Scientific-Atlanta, Inc.*

Hereby disclaims the entire term of said patent.

3,585,070.—*Charles R. Williams*, Longmeadow, Mass. METHOD FOR SIZING TEXTILES. Patent dated June 15, 1971. Disclaimer filed June 25, 1975, by the assignee, *Monsanto Company.*

Hereby enters this disclaimer to claims 2 and 6 of said patent.

3,710,862.—*Carter R. Young*, Carrollton, and *Henry J. James*, Dallas, Tex. METHOD AND APPARATUS FOR TREATING AND PREPARING WELLS FOR PRODUCTION. Patent dated Jan. 16, 1973. Disclaimer filed Aug. 25, 1975, by the assignee, *Otis Engineering Corporation.*

Hereby enters this disclaimer to claims 1, 5, 6, and 7 of said patent.

Dedications

3,318,683.—*Ellis L. Foster, Jr.*, Powell, and *Walter J. Hildebrand*, Columbus, Ohio. REFRACTORY METAL POWDERS. Patent dated May 9, 1967. Dedication filed Sept. 11, 1975, by the assignee, *Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,352,250.—*Gabriel Bouladon*, Versoix, Geneva, and *Paul Zuppiger*, Carouge, Geneva, Switzerland. TRANSPORT APPARATUS. Patent dated Nov. 14, 1967. Dedication filed Sept. 11, 1975, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,364,872.—*Gabriel Bouladon* and *Paul Zuppiger*, Geneva, Switzerland. CONTINUOUS TRANSPORT INSTALLATION. Patent dated Jan. 23, 1968. Dedication filed Sept. 11, 1975, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,440,046.—*John W. Droege* and *Carl W. Melton*, Columbus, Ohio. LIGHT INDUCED IMAGING OF SELENIUM IN THE PRESENCE OF CADMIUM OR MERCURY VAPORS. Patent dated Apr. 22, 1969. Dedication filed Sept. 11, 1975, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,523,148.—*Charles B. Boyer* and *Robert M. Conaway*, Columbus, Ohio. ISOSTATIC PRESSURE TRANSMITTING APPARATUS AND METHOD. Patent dated Aug. 4, 1970. Dedication filed Sept. 11, 1975, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 11, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-6-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-9-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-13-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-20-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-5-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-3-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-31-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-5-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-11-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-31-75

Expiration of patents: The patents within the range of numbers indicated below expire during November 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,858,537 to 2,862,204 inclusive
Plant Patents..... Numbers 1,768 to 1,774 inclusive

REISSUES

NOVEMBER 11, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

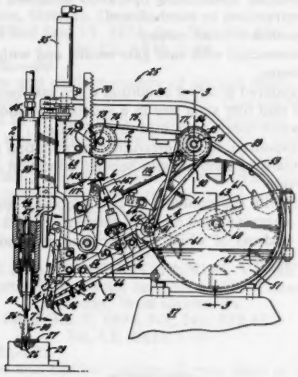
Re. 28,608
AUTOMATIC ASSEMBLY MACHINE

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon as Trustee of a trust identified as Paul H. Dixon Trust dated Jan. 28, 1975, Rockford, Ill.

Original No. 3,675,302, dated July 11, 1972, Ser. No. 96,329, Dec. 9, 1970. Application for reissue Apr. 8, 1974, Ser. No. 458,716

Int. Cl. B23q *7/10;* **B23p** *19/04*

U.S. Cl. 29—211 R **32 Claims**



1. An automatic assembly machine having a support, a rotatable feeding wheel on said support for delivering randomly oriented fasteners to an elongated track mounted on the support, a rotatable clearing wheel mounted on said support above said track for sweeping improperly oriented fasteners off of said track, and a power-reciprocated tool mounted on said support and movable through up and down strokes to receive properly oriented fasteners transferred from said track and to assemble the fasteners to workpieces, the improvement in said machine comprising, a rotatable member mounted on said support and turnable back and forth in timed relation to up and down reciprocation of said tool, first and second endless belt drives connecting said rotatable member to said feeding wheel and said clearing wheel, respectively, and first and second one-way clutches associated with said first and second drives, respectively, and operable to rotate said feeding wheel when said member is turned in one direction and to rotate said clearing wheel when said member is turned in the opposite direction while leaving each wheel idle during rotation of the other wheel.

Re. 28,609
APPARATUS FOR HANDLING FRAGILE SHEETS

Rene A. Malburet, Villeneuve-Saint-Georges, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

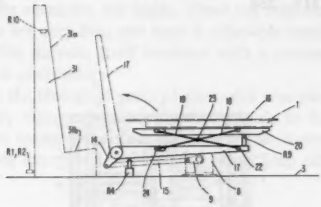
Original No. 3,679,073, dated July 25, 1972, Ser. No. 11,096, Feb. 13, 1970. Application for reissue Dec. 5, 1974, Ser. No. 529,618

Claims priority, application France, Feb. 13, 1969, 69.03391

Int. Cl.² B65G *57/28*

U.S. Cl. 214—1 Q **2 Claims**

1. Apparatus for handling sheets of material, in particular [,] glass, comprising [,] a pair of spaced parallel arms connected for movement as a unit and defining a first plane, means mounting said arms at one end thereof for pivoting about a generally horizontal fixed first axis parallel with said first plane and normal to said arms, first power means operable to pivot said arms about said first axis 90°, from a generally horizontal first position to a generally vertical second position, a pair of spaced parallel bars interconnected for movement as a unit and conjointly defining a second plane, said bars being adapted to support a sheet to be handled, [a pair] *two pairs* of crossed links *each associated with one of said bars and one of said arms, the links of each of said pairs being* pivoted together intermediate their ends [,] *with one link* [each said



link being] pivoted at one end to [one arm and one bar, respectively,] *a bar* and slidably and pivotally connected at its other end to [said bar and arm, respectively,] *an arm and with the other link pivoted at one end to an arm and slidably and pivotally connected at its other end to a bar,* and second power means connected *at each of said pairs of links* with the [end of the link slidable on and with respect to said one arm,] *link end which is slidably connected to an arm* to translate [the pivot therealong and] *that link end along such arm, said second power means* thereby selectively [vary] *varying* the separation of said planes while retaining them parallel.

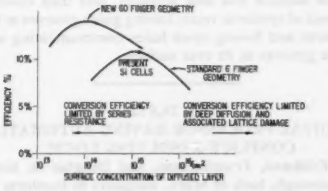
Re. 28,610
FINE GEOMETRY SOLAR CELL

Joseph Lindmayer, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Original No. 3,811,954, dated May 21, 1974, Ser. No. 184,393, Sept. 28, 1971. Application for reissue Nov. 19, 1974, Ser. No. 525,121

Int. Cl.² H01L *31/02, 31/04*

U.S. Cl. 136—89 **18 Claims**



1. A solar cell comprising a semiconductor material having top and bottom surfaces and having a p-n junction at a distance of between 500 A and 2,000 A from the top semiconductor surface thereof, said top surface being adapted to receive incident light radiation, an electrode on said bottom semiconductor surface, and a patterned electrode on said top semiconductor surface, said patterned surface comprising a plurality of thin metallic fingers electrically connected to-

gether, said thin metallic fingers being separated by *a* [distances] *distance* [on the order] of $n \times 10^{-2}$ centimeters where n is [a non-zero integer] *any number from one to nine*.

Re. 28,611
VARIABLE CONDENSER

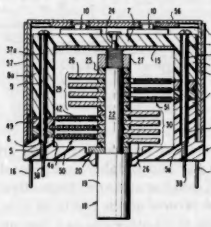
Takashi Shirakawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Original No. 3,818,287, dated June 18, 1974, Ser. No. 301,909, Oct. 30, 1972. Application for reissue Jan. 22, 1975, Ser. No. 542,901

Claims priority, application Japan, Oct. 30, 1971, 46-100992[U]; Mar. 3, 1972, 47-26317[U]; June 1, 1972, 47-64600[U]

Int. Cl.² H01G 5/38

U.S. Cl. 317—254 **7 Claims**



1. A variable condenser comprising:
front and rear side plates,
projections extending respectively from said front and rear side plates and toward each other,
pole brace inserting holes within said projections of said front side plates and carrying female threads therein,
pole braces at each projection location and having a threaded portion screwed into the threaded portion of said pole brace inserting hole within said front side plate projection,
stator electrode plate groups interleaved between the projections of said front and rear side plates respectively, and spacer groups intermediate said stator electrodes,
a dust cover engaging said front and rear side plates having a rear surface and side surfaces, said dust cover being formed of synthetic resin, having guide grooves at the side surfaces and having open holes communicating with the guide grooves at its rear surface.

Re. 28,612
DIGITAL PROCESSOR HAVING AUTOMATIC CONFLICT-RESOLVING LOGIC

Neil G. Frieband, Framingham, and Douglas O. Kendrick, Northborough, both of Mass., assignors to Incoterm Corporation, Marlboro, Mass.

Original No. 3,639,911, dated Feb. 1, 1972, Ser. No. 45,026, June 10, 1970. Application for reissue Jan. 28, 1974, Ser. No. 436,839

Int. Cl.² G06F 9/18

U.S. Cl. 340—172.5 **17 Claims**

1. A digital data processor for fetching and executing stored program instructions, some of which call for a transfer of digital information with any specified one of plural data processing devices capable of operation asynchronously of the processor, and having status components that store information identifying the operative status of the processor and an addressable memory element, said processor further having the improvement comprising

A. logic gate means for determining the presence of an interrupt-request signal from an identified one of said devices, and for determining the absence of a device-ready signal from an identified one of said devices,

B. logic switch means

1. normally operative in a first state for maintaining said processor in an instruction-executing state for the execution of programmed instructions, and

2. responsive to any one of said determinations from said gate means for switching from said first state to a second state for maintaining said processor in an executive state for transferring operation from one sequence of instructions to another, and

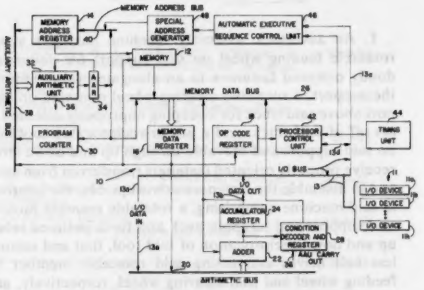
C. sequence control means

1. connected with said gate means and with said switch means,

2. rendered in a first condition when said switch means is in said first state and in a second condition when said switch means is in said second state.

3. responsive to an interrupt determination by said gate means to assume said second condition and successively

a. write the contents of said processor status components into said memory element at a first location the address of which is associated with said identified device,



b. read previously stored status information from said memory element at a second location the address of which is associated with said identified device and load it into said processor status components,

c. condition said switch means to switch from said second state to said first state, and

4. responsive to a device-ready absence determination by said gate means to assume said second condition and successively

a. write the contents of said processor status components into said memory element at [a] *said* second location [the address of which is associated with said identified device],

b. read previously stored status information from said memory element at [a] *said* first location the address of which is associated with said identified device and load it into said processor status components, and

c. condition said switch means to switch from said second state to said first state.

PLANT PATENTS

GRANTED NOVEMBER 11, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,801
JUNIPER BAKAUREA

John Cornelius Bakker, Jr., St. Catharines, Ontario, Canada, assignor to J. C. Bakker & Sons Ltd., St. Catharines, Ontario, Canada

Filed Jan. 17, 1974, Ser. No. 434,035
Int. Cl. A01h *7/00*
U.S. Cl. Plt.—50 **1 Claim**

1. A new and distinct variety of juniper plant, substantially as herein shown and described, characterized particularly as to novelty by a unique combination of vigorous, dense and compact growth, low growing and spreading growth habit with attractive foliage of juvenile form, not being lacy; and with branches of golden color which is pronounced and vivid over the plant and is not confined principally to the growing tips.

3,802
ROSE PLANT—BICENTENNIAL VARIETY

Carl Meyer, Cleves, Ohio, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 7, 1974, Ser. No. 512,433
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the red colors, with unique flower form, vigorous growth, medium flower size with bloom produced in abuandance, and heavy leathery foliage.

3,803
ROSE PLANT—MEIGERIUM VARIETY

Marie-Louise Meilland and Alain A Meilland, Antibes, and Michele Meilland Richardier, Tassin-la-Demi-Lune, France, assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 24, 1974, Ser. No. 517,819
Claims priority, application Morocco, Jan. 28, 1974, 16,662
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as illustrated and described, distinguished as to novelty,

from the physical point of view, the plant, with medium green adult foliage, is erect, the flower is double, light vermilion red inside, blood red outside, the petals are very firm and have a yellowish unguis with a white aureole, itself bordered with a succcinct fuchsine pink halo;

from the biological point of view, this rose-plant grows very vigorously, shows great aptitude to forcing, is not specially sensitive to diseases, its flowers last a long time when cut, and the petals drop off cleanly.

3,804
ROSE PLANT—MEIRINGA VARIETY

Marie-Louise Meilland and Alain A. Meilland, Antibes, and Michele Meilland Richardier, Tassin-la-Demi-Lune, France, assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 24, 1974, Ser. No. 517,820
Claims priority, application Morocco, Dec. 7, 1973, 16,626
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as illustrated and described, distinguished as to novelty, from the physical point of view, the plant, with light green mature wood, is erect, the flower is double, white, the petals are very firm and have a yellowish unguis whose color is more noticeable inside than outside; from the biological point of view, this rose plant grows vigorously, has a particular aptitude for forcing, its flowers last a long time when cut, and the petals drop off cleanly.

PATENTS

GRANTED NOVEMBER 11, 1975

ERRATA

For CLASS	See PATENT NO.
228–173	3,911,553
320–039	3,912,108
280–478	3,912,119
229–041 B	3,912,331
305–010	3,912,335
305–012	3,912,336
305–054	3,912,338
356–170	3,912,372
416–244	3,912,375
156–104	3,912,542
360–079	3,912,694

PATENTS

GRANTED NOVEMBER 11, 1975

NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

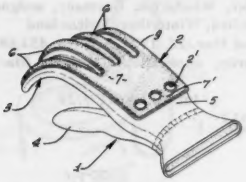
GENERAL AND MECHANICAL

3,918,096

FLEXIBLE MOTORCYCLE GLOVE

Eui Joon Lim, Seoul, North Korea, assignor to Triple "A" Accessories, Inc., Gardena, Calif.

Filed Nov. 1, 1974, Ser. No. 520,442
Claims priority, application Korea, May 28, 1974, 22880/74
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A **7 Claims**



1. A sports glove having a hand receptacle and multiple finger receptacles projecting therefrom, comprising

a. a backer layer having multiple elongated finger sections corresponding to the backs of said glove finger receptacles, and a back hand section corresponding to the back of the glove hand receptacle,

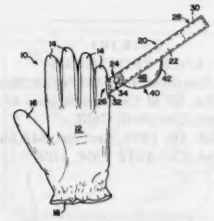
b. the backer finger and back hand sections respectively attached to the backsides of the glove finger receptacles and hand receptacle to impart thereto a convex curvature at the palm side of the glove and conforming to the user's hand curvature.

3,918,097

SPORT GLOVE

Irving A. Mlodoch, 4705 1st Street West, Bradenton, Fla. 33505

Continuation of Ser. No. 394,788, Sept. 6, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,894
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A **6 Claims**



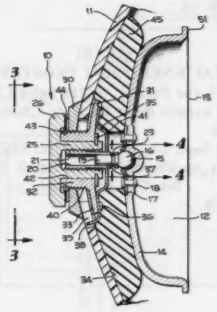
1. A sport glove structure primarily designed to grip a club or like sport instrument, said glove structure comprising: a glove palm, a plurality of glove fingers attached to said glove palm, each of said plurality of glove fingers disposed in spaced, unconnected relation to one another, a back surface disposed oppositely to said glove palm and connected to said plurality of glove fingers; a retention means attached to said glove structure and including a strap member, said strap member comprising a first end and a second end oppositely disposed relative to one another, strap connecting means attached to an endmost finger of said plurality of fingers, said first end of said strap member connected to said strap connecting means; strap securing means attached to said glove structure in spaced relation to said strap connecting means, said second end of said strap member connected to said strap securing means; finger orienting means formed on said strap member and configured to engage a predetermined number of glove fingers disposed in folded, closed position, whereby said predetermined number of glove fingers are maintained in a folded position when said strap member is connected at its first and second ends to said strap connecting means and said strap securing means, respectively.

3,918,098

THREADED EARCUP SUSPENSION SYSTEM

Robert P. Devaney, San Dimas; Erwin J. Fellner, La Crescenta, and William A. Cohen, Pasadena, all of Calif., assignors to Sierra Engineering Co., Sierra Madre, Calif.

Filed Jan. 22, 1975, Ser. No. 543,132
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—209 **7 Claims**



1. An adjustable earcup suspension for mounting on a protective helmet shell comprising an earcup having one joint member of a universal joint disposed therein, a threaded stud including the other joint member of said joint, fastening means holding said joint members in operating association, said shell having a clearance recess in axial alignment with said earcup, a locking assembly having one element overlying the interior of the shell, a connecting section of cross-sectional size smaller than said recess extending through said recess and another element of said assembly overlying the exterior of the shell in adjustable engagement with said connecting section for adjustably fixing the position of the earcup relative to the center of the recess, an adjusting knob rotatably mounted on the exterior of the locking assembly and a threaded connection between the adjusting knob and said supporting stud whereby to adjustably shift the location of said earcup alternatively away from or toward the shell.

3,918,099

ARTIFICIAL ORGAN OR PART OR SECTION THEREOF FOR IMPLANATION INTO THE HUMAN BODY AND METHOD OF PRODUCING THE SAME

Jürgen Führ, Holitzberg 83, Hamburg, and Helmut Fettback, Eichenweg 8, Buxtehude, both of Germany

Filed May 29, 1974, Ser. No. 474,154
Claims priority, application Austria, May 29, 1973, 4679/73
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1 **6 Claims**

5. An artificial organ and parts, sections and the like of artificial organs, adapted to be implanted into a human body comprising a hardened plastomer, said plastomer comprising

10 to 80 percent of one of artificial albumen and protein and 80 to 10 percent human blood of a blood group corresponding to the blood group of the patient in which the artificial organ is to be implanted.

3,918,100
SPUTTERING OF BONE ON PROSTHESES

Bevil J. Shaw, Murrysville, and Richard P. Miller, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1974, Ser. No. 469,182
Int. Cl.² A61F *1/00*; C23C *15/00*
U.S. Cl. 3—1.9 **12 Claims**

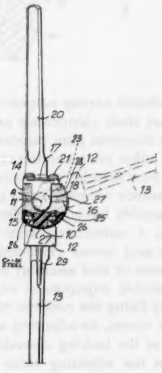
1. A prosthesis for use as a bone implant comprising:
a metallic base conforming to the shape of the bone to be replaced; and
a coating of bone material impinged upon and adhered to said prosthesis by *rf* sputtering,
whereby said bone material will induce living bone growth around the implant and, additionally, will eliminate the necessity for bone grafting.

6. A method of forming a bone replacement or bone repair prosthesis comprising adhering bone particles to a prosthetic form by *rf* sputtering.

3,918,101
TOTAL KNEE-JOINT PROSTHESIS

Jean Lagrange, 7, rue Pasteur, 92210 Saint-Cloud, and Emile Letournel, 15 avenue de la Porte de Choisy, 75013 Paris, both of France

Filed Sept. 23, 1974, Ser. No. 508,613
Claims priority, application France, Oct. 2, 1973, 73.31528
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 **6 Claims**



1. A total knee-joint prosthesis comprising:
a metallic rocker member with a horizontal pin, a stem depending from said pin for insertion into the tibial shaft, and a cradle on said stem below said pin having a concave top surface centered on the pin axis, said cradle having a flat underside engageable with the upper end of the tibia; an upper bearing part adapted to be imbedded in and cemented into the femoral condyles;
a lower bearing part adjoining said upper bearing part along a parting surface substantially coinciding with a horizontal axial plane of said pin, said bearing parts together defining a pair of journal bores bisected by said parting surface and centered on said pin axis for positively engaging the ends of said pin on opposite sides of said stem, said lower bearing part having a convex bottom surface centered on said pin axis in mating engagement with the top surface of said cradle, at least said lower bearing part being provided with a rearwardly facing median cutout accommodating said stem for a unidirectional swing of said rocking member from a depending vertical position, said bottom surface continuously engaging said top surface throughout the swing range for relieving said pin of stresses; and
fastening means interconnecting said bearing parts for holding said pin in position.

3,918,102
ARTIFICIAL HIP JOINT

Joachim Eichler, Wiesbaden, Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

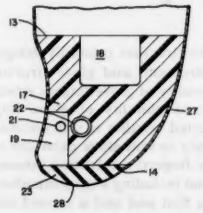
Filed Mar. 25, 1974, Ser. No. 454,680
Claims priority, application Germany, Mar. 24, 1973, 2314708
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.912 **17 Claims**

11. A support bearing for embedment in a prepared socket in a pelvis comprising a generally cup-shaped element defining a substantially part-spherical internal cavity for reception of a socket for a femoral condyle and having an external flange adjacent the mouth of said cavity and having a plurality of fingers extending in cantilever fashion inwardly from said flange into said cavity to define at least one aperture affording communication between the external surface of the bearing support and the socket.

3,918,103
KNEE PROSTHESIS

James W. Breakey, San Jose; John M. Freter, Santa Clara, and Jack Wren, Dublin, all of Calif., assignors to Hosmer/Dorrance Corporation, Campbell, Calif.

Filed Feb. 10, 1975, Ser. No. 548,865
Int. Cl.² A61F *1/04*, *1/08*
U.S. Cl. 3—22 **8 Claims**



1. A prosthetic device for the knee, comprising a truncated, generally tapered, rigid, block portion of generally oval cross section, a knee pad portion adjacent the truncated surface of said rigid portion and integrally joined thereto, said knee pad

portion formed of resilient material, and an exterior coating layer joined to the exterior surface of said rigid solid portion and abutting said knee pad portion.

3,918,104

FLAP COVER WITH WATER DISTRIBUTING DEVICE FOR SANITARY APPARATUSES

Paul Lucien Coutellier, 36, rue Bui-thi Xuan, Saigon, South Vietnam

Filed Dec. 29, 1972, Ser. No. 319,633
Int. Cl. A47k *3/22, 11/08*
U.S. Cl. 4—6 **2 Claims**

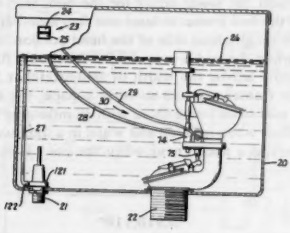
1. A sanitary apparatus such as a toilet, bidet or drainer with a water distributing device comprising a bowl, a cover, means pivotally connecting said cover to said bowl, a shower head, said means having a passage for water therethrough, means carried by said cover in communication with said shower head and said passage and capable of passing water therebetween, a slide being slideably mounted on said cover and carrying said shower head facing said bowl, and said cover has two walls with said cover carried means being a passage between said walls.

3,918,105

HYDRAULICALLY OPERATED LIQUID VALVE WITH TWO CLOSABLE INLETS

Henry A. Young, Muncie, Ind., assignor to Young Engineering & Manufacturing Company, Inc., Ind.

Continuation-in-part of Ser. No. 127,602, March 24, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,366
Int. Cl. E03d *1/22, 1/30, 1/34*
U.S. Cl. 4—67 A **12 Claims**



1. A liquid valve comprising:

a hollow body having first and second liquid inlets and a liquid outlet with said inlets being at different elevations; a first closure mounted to said body and movable to close and open said first inlet;

a second closure mounted to said body and movable to close and open said second inlet;

first hydraulic means coupled to said first closure and operable to open said first closure, and second hydraulic means coupled to said second closure and operable to open said second closure;

said first hydraulic means simultaneously opening said first closure and locking said second closure closed; and

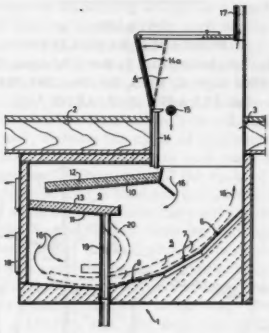
actuator means connectable to a source of liquid pressure and coupled to said first and second hydraulic means and operable to selectably direct said pressure to operate said first or second hydraulic means, said actuator having first and second finger operable members, each of said members having a movable spring biased piston with plug attached.

3,918,106

METHOD AND APPARATUS FOR NATURAL BIOCHEMICAL DECOMPOSITION OF LATRINE

Ake O. W. Hellqvist, Djurhamn, Sweden, assignor to AB Sundsvalls Specialprodukter, Sundsvall, Sweden

Filed May 23, 1974, Ser. No. 472,634
Int. Cl.² A47K *11/02;* **C05F** *3/04*
U.S. Cl. 4—120 **11 Claims**



1. Apparatus for effecting the simultaneous decomposition of feces and urine comprising a decomposition container having a toilet chair mounted at the upper part thereof, said decomposition container containing a feces decomposition bed, a urine decomposition bed said beds being as separate units, and means directing the urine primarily to the urine decomposition bed and said urine decomposition bed being offset from the feces decomposition bed.

3,918,107

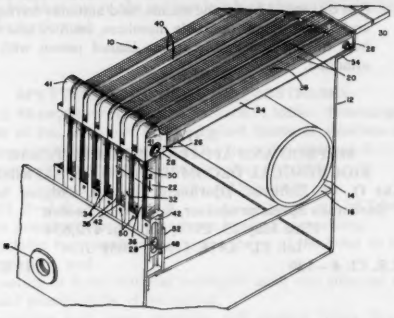
GRILL FOR SWIMMING POOL GUTTER

George R. Whitten, Jr., 11 Highland Ave., Bellingham, Mass. 02019, and Jean E. Lewis, 46 Dorset Road, Holliston, Mass. 01746

Continuation of Ser. No. 414,775, Nov. 12, 1973, abandoned. This application Aug. 15, 1974, Ser. No. 497,534
Int. Cl.² E04H *3/20*
U.S. Cl. 4—172.17 **9 Claims**

1. A grill for a swimming pool overflow gutter comprising an inner grill wall which includes means defining a plurality of spaced-apart openings therein, through which openings water skimmed from the surface of the pool may pass on its way into the overflow gutter, adjustable closure means mounted in the spaced-apart openings to close at least a portion of the openings and to define an overflow lip for the overflow gutter, and

means for mounting said adjustable closure means for vertical movement in said openings, whereby vertical movement of the



adjustable closure means changes the height of the overflow lip.

3,918,108

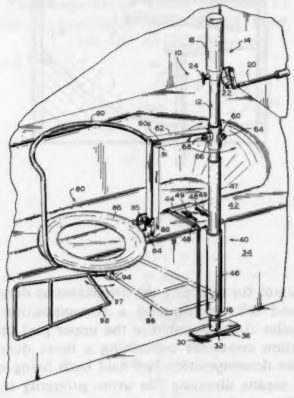
PORTABLE BATH LIFT

Raymond M. Feyerherm, Rte. 1, Box 8B, Alsea, Oreg. 97324

Filed Sept. 6, 1973, Ser. No. 394,551

Int. Cl.[2] A47K *3/12*; A61G *7/02*

U.S. Cl. 4—185 L **10 Claims**



1. A portable bath lift for assisting a person in and out of a bathtub comprising:

a columnar jack means having a vertically extensible portion and a lower non-extensible portion for positioning in a vertical disposition alongside said tub,

a floor-engaging base adapted to removable receive and support in a vertical disposition said lower non-extensible portion of said jack means,

at least said vertically extensible portion of said jack means being rotatable about its vertical axis relative to said base, detachable clamp means carried by said jack means and being vertically adjustable along said jack means for connecting said jack means to rim portion of said bathtub and free to rotate relative to at least said vertically extensible portion of said jack means so that said clamp means when operative remains stationary on said rim portion when said extensible jack portion rotates annd extends,

seat suspension means removably attached to and carried by said vertically extensible jack portion for vertical and rotational movement therewith, said suspension means being generally L-shaped and including a first leg portion extending generally horizontally outwardly from said extensible jack portion and a second generally vertical leg portion extending downwardly from the outer end of said first leg portion,

seat means, including an annular seat ring removably connected to a lower end of said vertical leg portion of said suspension means and supported by said suspension means in a horizontal disposition and an open-centered seat supported on said seat ring, said seat means further including a removable railing member having one end detachably connected to said seat ring and its other end detachably connected to said suspension means and defining a back rest and side support for a person seated on said open-centered seat,

said vertically extensible portion of said jack means when rotated about its vertical axis being operable to swing said suspension means and said seat means from a loading position along the rim portion of a bathtub to a position overlying the interior of said bathtub while said jack means remains stabilized in a vertical disposition alongside said bathtub by said base and clamp means.

3,918,109

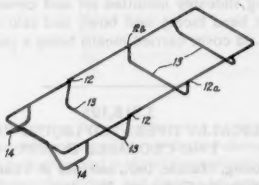
PACK-BED

Lindsay Ralph Barraclough, Briagolong, Victoria, Australia

Filed Mar. 29, 1974, Ser. No. 456,365

Int. Cl.[2] A47B *83/04*

U.S. Cl. 5—113 **23 Claims**



19. A combined stretcher and pack wherein the stretcher comprises a substantially rectangular shaped rigid bed frame hinged so as to fold into a suitable sized pack frame, a series of hingedly mounted legs attached to said frame to elevate the bed in its assembled position, a sheet of sufficient width and length to form the lower cover for the bed, said sheet being secured to the bed frame, at least one flap member secured to at least one longitudinal side of the head portion of the frame such that when the bed is in its folded form, said flap member folds inwardly across the width of said stretcher to securely enclose the framework and so form a pack, the upper head portion of said sheet being fitted with an inflatable bladder for use as a pillow when inflated and when in a deflated condition serves to act as a pack cover when the pack is in the folded position.

3,918,110

WATER BEDS AND METHOD OF MAKING THE SAME

Enrique J. Cantillo, Santa Ana; John D. Tabata, and Frank M. Tabata, both of Los Angeles, all of Calif., assignors to American Thermo-Seal, Inc., Los Angeles, Calif.

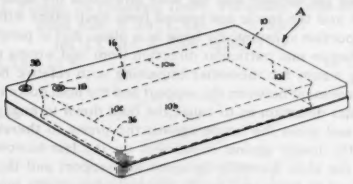
Filed May 17, 1974, Ser. No. 470,956

Int. Cl.[2] A67C *27/08*; B31F *7/00*

U.S. Cl. 5—348 WB **18 Claims**

1. A water bed for supporting a body thereon, said water bed comprising upper and lower walls, a first continuous peripheral wall extending between said upper and lower walls and forming a water chamber therebetween, a first projected flange extending continuously along the entire peripheral length of the upper margin of said first continuous peripheral wall and being integral therewith, a first water tight lap seal

securing said upper wall to the first flange on the upper margin of said first continuous peripheral wall continuously along the outer peripheral length thereof, a second projected flange extending continuously along the entire peripheral length of the lower margin of said first continuous peripheral wall and being integral therewith, a second water tight lap seal securing said lower wall to the second flange on the lower margin of said first continuous peripheral wall continuously along the entire peripheral length thereof, said first peripheral wall having an upstanding wall section which is permanently convex to the water chamber along its entire peripheral length,



said upper and lower walls extending beyond said first continuous peripheral wall, a downwardly extending flap formed on said upper wall and an upwardly extending flap on said lower wall, and each of said flaps having continuous peripherally extending end portions, each of said end portions being lap sealed to each other along their entire peripheral lengths to form a second continuous peripheral wall and being spaced outwardly from said first continuous peripheral wall, thereby forming an air chamber between said upper and lower walls and said first and second continuous peripheral walls surrounding said water chamber.

3,918,111

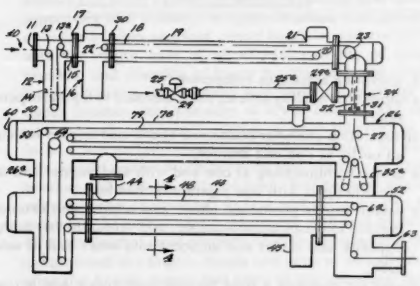
YARN HEAT TREATING PROCESS

Harold H. Dunn, 2362 Kings Point Drive, Atlanta, Ga. 30341

Filed Jan. 22, 1973, Ser. No. 325,731

Int. Cl.² D06B *3/04*

U.S. Cl. 8—149.1 **11 Claims**



1. In a process for treating yarn in a steam atmosphere at elevated pressure maintained in an enclosure the steps comprising feeding a continuous length of yarn from a first low pressure zone through a seal into a chamber portion of the enclosure, applying dye to the yarn in the chamber portion, subsequently passing the yarn through a sequence of tubes each of which has an end in communication with the chamber portion, heating the yarn passing through said tubes by passing steam in contact with the exterior of the tubes at a higher pressure and temperature than exists in the enclosure, and passing the yarn leaving the last tube of the sequence through a seal to a second low pressure zone.

3,918,112

WASHING LAUNDRY ARTICLES

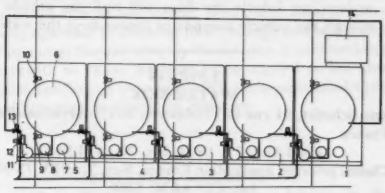
Klaus Seibt, Ludwigsburg, Germany, assignor to Seikt & Kapp Maschinenfabrik, Ludwigsburg, Germany

Filed May 23, 1973, Ser. No. 363,154

Claims priority, application Germany, June 2, 1972, 2226992

Int. Cl.² D06F *31/00*

U.S. Cl. 8—158 **6 Claims**



1. A method of laundering articles in a machine having a plurality of washing/spinning units each having an identical cycle of operation including sequential stages of soaking, washing, rinsing and spinning comprising the steps of feeding liquid to each unit at the last stage thereof, withdrawing liquid from each unit at the first stage thereof and transferring liquid at each of the intermediate stages from each unit to its next successive unit, dividing the cycle of operation in each unit into equal intervals and allotting to each stage an equal time length, staggering the beginning of the cycle of operation of each of the units so that at least one unit carries out the transfer of liquid while the other units carry out one of said sequential stages, timing the interval between the beginning of the cycle of operation of the individual units so that the liquid transferred from each unit passes into the next succeeding unit at the stage in the cycle of operation for the succeeding unit lying in time relationship prior to the stage in which it was used in the preceding unit, and determining the number of stages in the cycle of operation so that a continuous working of the machine is achieved wherein the same liquid is used for two or more stages in two or more units.

3,918,113

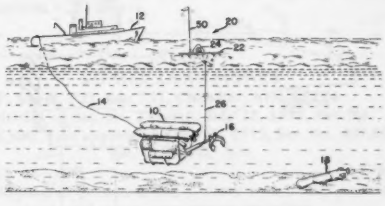
SURFACE TRACKER FOR AN UNDERWATER VEHICLE

Howard R. Talkington, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1975, Ser. No. 543,736

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **4 Claims**



1. A surface tracker for an underwater vehicle comprising:

a float;

a reel mounted to the float;

said reel being loaded with a line, the free end of which can be attached to the underwater vehicle;

spring means connected to the reel for biasing the reel in a direction to wind the line on the reel,

said float being an elongated board which is adapted to lie flat in the water with a top side and a bottom side,

said reel being mounted on top of the board with the central axis of the reel extending athwart the board;

said board having an aperture in the proximity of said reel; said line extending from the reel and through the aperture; and

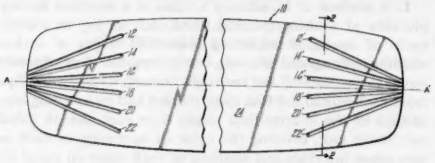
means mounted to the bottom of the board and extending therebelow for receiving the line and guiding its payout and retrieval,

whereby upon attaching the free end of the line to the underwater vehicle the float will trail the vehicle even though the vehicle ascends or descends in the water.

3,918,114
WATER SKIS

Bruno Schmitt, 91 rue de l'Industrie, 38170 Seyssinet-Pariset, France

Filed May 21, 1974, Ser. No. 471,861
Claims priority, application France, Nov. 7, 1973, 73.39500
Int. Cl.² A63C *5/04*
U.S. Cl. 9—310 R **4 Claims**



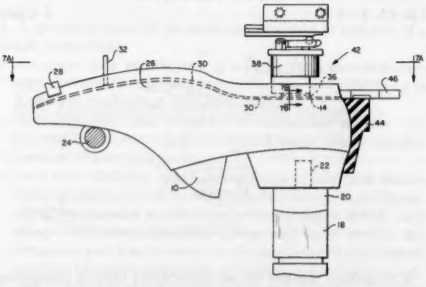
1. In water ski, the ski comprising an elongated body having an upper foot supporting side and an oppositely disposed base and normally leading and trailing edges, the improvement comprising:

a first plurality of grooves in the base of the ski, said grooves extending inwardly from the normally trailing edge of the ski at an oblique angle with respect to the longitudinal axis of the ski in such a manner as to deflect water passing therethrough toward the trajectory of the ski, said grooves terminating intermediate the length of the ski.

3,918,115
WIPING METHOD AND LASTING MACHINE-SHOE ASSEMBLY COMBINATION USED THEREWITH

Victor E. Santilli, Framingham, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Jan. 9, 1975, Ser. No. 539,902
Int. Cl.² A43D *21/00, 3/00*
U.S. Cl. 12—145 **4 Claims**

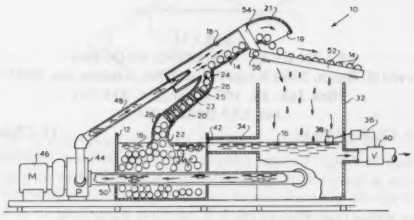


1. A lasting machine-shoe assembly combination for use in wiping a selected portion of the margin of an upper against the corresponding portion of an insole comprising: a support mounted for heightwise movement in a particular direction; a shoe assembly, formed of a last having the upper mounted thereon and the insole located on its bottom with said upper margin portion extending upwardly of the periphery of said insole portion, supported bottom-up on said support; wiping means mounted for inward planar movement in a wiping stroke with respect to the shoe assembly in a particular plane that is substantially at right angles to said particular direction from a retracted position to an advanced position, the bottom surface of the wiping means lying in a wiping plane that is substantially parallel to said particular plane; a hold down located above the shoe assembly; at least one prong mounted to said last and extending upwardly of the last bottom beneath the insole, said prong being in registry with said hold-down along said particular direction; retaining means initially so retaining the support and the hold down that the hold-down bottom and the insole are spaced from each other with said insole portion substantially lying in a plane that is parallel to and offset in said particular direction from said wiping plane; moving means for thereafter imparting such relative heightwise movement between the support and the hold down in said particular direction as to cause the hold down to engage the insole and press the insole against the prong to thereby restrain the insole against movement on the last bottom and clamp the shoe assembly between the support and the hold down and to bring said insole portion substantially into said wiping plane; and means for thereafter imparting said wiping stroke to said wiping means to thereby wipe said margin portion against said insole portion.

3,918,116
FOOD LIFT

Joseph M. Valdespino, 5023 Golf Club Parkway, Orlando, Fla. 32808

Filed Nov. 27, 1973, Ser. No. 419,402
Int. Cl.² A23N *13/00*; B65G *51/00*
U.S. Cl. 15—3.13 **6 Claims**



1. Elevating apparatus comprising:

a hopper for holding articles to be elevated in liquid suspension;

an aspiration chamber positioned above said hopper having an outlet at one end thereof;

a tube communicating at one end with said hopper and at the other end with said aspiration chamber;

a venturi nozzle positioned above said hopper and extending into said aspiration chamber, said venturi nozzle being opposite said outlet and adjacent said other end of said tube;

means for pumping a fluid through said nozzle and across the other end of said tube in said chamber whereby said liquid suspended articles are drawn through said tube and out of said outlet;

a compartment for storing said liquid;

means for feeding said liquid out of said storage compartment and into said hopper, said feeding means further comprising means for limiting said liquid flow only from the top of liquid in said storage compartment, said limiting means comprising a conduit communicating between said hopper and an upper portion of said storage compartment and an overflow valve in said compartment for limiting said liquid level to about the level of said conduit;

means for receiving said articles at said outlet and moving

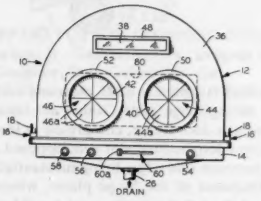
said articles in a downwardly direction with respect to said outlet, said receiving means comprising a chute communicating with said outlet of said aspiration chamber, said chute being positioned above said storage compartment and having apertures therein such that said liquid flows out of said aspiration chamber downward through said apertures and into said compartment, said chute including parallel sidewalls and said apertures comprise longitudinal slots parallel with said sidewalls.

3,918,117

SURGICAL WASHING DEVICE

Lucille I. Plante, 16 Pinecrest Drive, Plainville, Conn. 06062

Filed Nov. 4, 1974, Ser. No. 520,801
Int. Cl.² A47K *7/04*; B08B *1/04*
U.S. Cl. 15—21 D **10 Claims**



1. A washing device operable to be used to effectively and efficiently scrub the arms, hands and fingers of an individual so as to effect a sterilization thereof comprising:

a. an enclosure for the operating components of the washing device including a base, a detachable cover, and means mounting said detachable cover on said base, said detachable cover including one wall having at least a pair of openings formed therein and means supported in each of said pair of openings for movement between a first position and a second position relative thereto and operable in said first position to provide a closure for each of said pair of openings and in said second position thereof to permit the fingers, hands and arms of an individual to be inserted through said pair of openings;

b. brush means mounted for rotation in said enclosure, said brush means including a plurality of upper brushes, a plurality of lower brushes, a center brush and first means supporting said plurality of upper brushes, said plurality of lower brushes and said center brush in said enclosure with the major axes of all of said plurality of upper brushes, said plurality of lower brushes and said center brush extending horizontally and with said plurality of upper brushes, said plurality of lower brushes and said center brush positioned relative to each other so as to form a horizontally extending passage located on each side of said center brush between said plurality of upper brushes and said plurality of lower brushes and aligned with said pair of openings in said wall of said cover for receiving therewithin for engagement with said plurality of upper brushes, said plurality of lower brushes and said center brush the fingers, hands and arms of an individual after the fingers, hands and arms of the individual have been passed through said pair of openings in said wall of said cover, said brush means further including a plurality of fingertip brushes and second means supporting said plurality of fingertip brushes in said enclosure with the major axis of each of said plurality of fingertip brushes extending at right angles to the major axis of each of said plurality of upper brushes, said plurality of lower brushes and said center brush and with said plurality of fingertip brushes being positioned so as to have the major axes thereof aligned with but extending at right angles to said horizontally extending passages formed on either side of said center brush for engagement thereby with the fingertips of the fingers of an individual when the arms, hands and fingers thereof are located within said horizontally extending passages;

c. drive means supported within said enclosure including electrical motor means and means drivingly interconnecting said electrical motor means with said plurality of upper brushes, said plurality of lower brushes, said center brush and said plurality of fingertip brushes for imparting rotation thereto from said electrical motor means; and

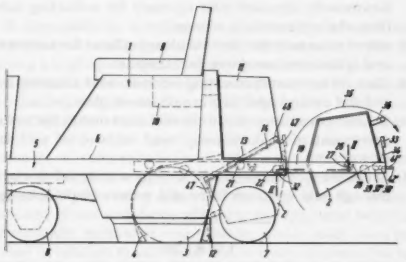
d. fluid dispensing means including conduit means having a multiplicity of openings formed therein and means supporting said conduit means in said enclosure in spaced relation to said horizontally extending passages formed on either side of said center brush, said conduit means being operable to dispense fluid through said multiplicity of openings thereof to spray the interior of said enclosure therewith to cause the fluid to be applied to the arms, hands and fingers of an individual when positioned within said horizontally extending passages.

3,918,118

SWEEPING MACHINE

Hugo vom Berg, Bad Schwartau, and Heinz Schalmath, Bad Oldesloe, both of Germany, assignors to Jungheinrich Unternehmensuerwaltung KG, Hamburg, Germany

Filed Nov. 12, 1974, Ser. No. 523,041
Claims priority, application Germany, Nov. 17, 1973, 2357467
Int. Cl.² E01H *1/04*
U.S. Cl. 15—83 **11 Claims**



1. A sweeping machine comprising a wheeled chassis, a downwardly open brush housing mounted on the chassis, a cylindrical brush rotatably mounted in the brush housing, a dirt container, which is detachably connected to the brush housing, frame section members extending along the chassis on both sides thereof, carriers which are slidably guided in said frame section members in the longitudinal direction thereof, and bearing means pivotally connecting said dirt container to said carriers.

3,918,119

ROTARY LAWN MOWER

Dale F. Sweet, P.O. Box 757, Chandler, Ariz. 85224

Division of Ser. No. 275,468, July 27, 1972, Pat. No. 3,805,500. This application Oct. 18, 1973, Ser. No. 407,601
Int. Cl.² A47L *7/00*
U.S. Cl. 15—328 **1 Claim**

1. Apparatus for converting a rotary lawn mower to a vacuum sweeper, said rotary lawn mower including:

a mower frame,

wheel means carried by said frame for supporting said frame above the ground,

a horizontal mower blade rotatably mounted on said frame at grass-cutting height,

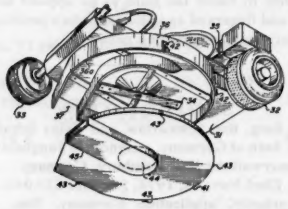
motor means carried by said frame for rotating said mower blade,

a fixed mower blade housing carried by said frame above said mower blade and having a downwardly depending peripheral skirt enclosing the space swept by said rotating blade, and

means defining an aperture in said skirt for expelling grass cuttings from said housing,

said apparatus comprising:

a. a cover plate member shaped and dimensioned to sealingly engage the lower edge of said peripheral skirt, providing a closure for said mower blade housing, said cover plate having a central aperture therein located generally coaxially with respect to the axis of rotation of said mower blade;



b. an elongate suction cleaning head forward of said lawn mower and extending laterally thereto and having a downwardly directed inlet aperture for collecting debris from the surface to be cleaned;

c. wheel means carried by said cleaning head for supporting said inlet aperture above said surface;

d. duct means communicating between said cleaning head and the central aperture in said cover plate;

e. flexible connection means in said duct means for vertical movement of said cleaning head relative of said lawn mower; and

f. means for receiving and temporarily storing debris ejected through said aperture from said mower blade housing.

3,918,120

SAFETY CAP FOR THE INNER WIRE OF A BOWDEN CABLE

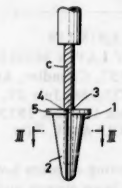
Kunihiko Yoshikawa, Soka, Japan, assignor to Kabushiki Kaisha Yoshikawa Seisakusho, Tokyo, Japan

Filed Sept. 19, 1974, Ser. No. 507,489

Claims priority, application Japan, Sept. 20, 1973, 48-109292; Jan. 16, 1974, 49-7294; Mar. 29, 1974, 49-35124

Int. Cl.² F16L *11/10*

U.S. Cl. 16—108 **10 Claims**



1. An article of manufacture comprising a frustoconical cap-like body having opposite ends and being of elastic material, said body being longitudinally extended and being provided with a peripheral longitudinally extended slit of V-shaped section and with an insertion hole in one of said ends adapted to accommodate a wire.

3,918,121

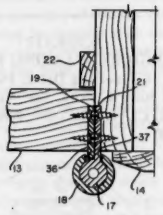
DOOR LOCK

John R. Williams, 871 S. Gramercy Drive, Apt. No. 2, Los Angeles, Calif. 90005

Filed Aug. 20, 1973, Ser. No. 389,978

Int. Cl.² E05D *9/00*, *11/06*

U.S. Cl. 16—128 **4 Claims**



1. A door lock adapted to slide onto and cooperate with a door hinge having hinge plates which are fastened one to a door and one to a door frame, comprising at least one tubular section having a longitudinal slot with opposed spaced edges, the spacing between said edges being substantially equal to the combined thickness of the hinge plates, whereby when the door is closed the tubular section can be slid onto the hinge with the edges of the slot impinging upon the outer surface of the hinge plates to clamp the plates and prevent pivotal movement of the hinge plates about the hinge pin, whereby force applied to open the door will tend to pull the hinge plates from the door and frame thereby moving the outer edge of the door against the opposite side of the door frame for providing further locking action to prevent opening of the door, said opposed spaced edges being bent endwardly at one end of said tubular section for limiting the longitudinal movement of said section on said hinge and at least on rib extending around the periphery of said tubular section to provide rigidity therefore.

3,918,122

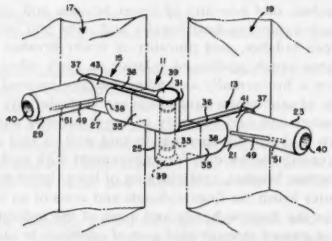
HINGE AND SETTING APPARATUS THEREFOR

Joseph L. Gagner, P.O. Box 1406, Los Gatos, Calif. 95030

Filed Dec. 23, 1974, Ser. No. 535,705

Int. Cl.² E05D *11/00*

U.S. Cl. 16—137 **9 Claims**



1. A flush mounted hinge comprising:

1. a pair of mountable hinge elements adapted to be secured to a mounting surface, one to a doorjamb and the other to a door edge, each comprising:

A. a flat arm adapted to be attached with one face thereof abutting said mounting surface;

B. a mounting plug integral with said arm adjacent one end thereof and extending perpendicularly therefrom so as to be insertable into a hole in said mounting surface thereby fixing the hinge elements to their respective surfaces; and

C. a sleeve integral with said arm adjacent the other end thereof having a pin bore therethrough, the longitudinal axis of said bore being parallel to the mounting surface to which the element is fixed, said arm having a guide hole therethrough intermediate said plug and said sleeve angled toward the mounting plug, said plug having an angled receptor orifice therein aligned with the guide hole axis, such that a cylindrical member inserted through said guide hole in line with the axis thereof enters said orifice to thereby triangularly brace said element to said mounting surface; and

2. a pin adapted to be inserted in the pin bores of each of said pair of mountable hinge elements to attach the elements while allowing relative rotation about the bore axes.

3,918,123

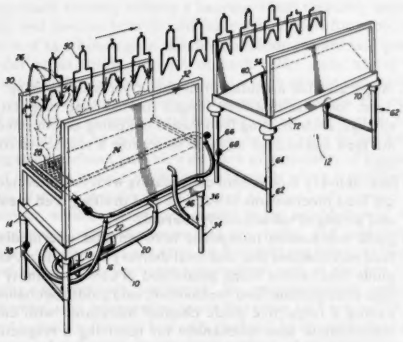
APPARATUS FOR STUNNING FOWL

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed July 16, 1973, Ser. No. 379,204

Int. Cl.[2] A22C *21/00*; **A22B** *3/08*

U.S. Cl. 17—11 **3 Claims**



1. A poultry stunning system comprising, in combination:

shackle conveyor means engaging the feet of successive poultry for travelling the poultry head down along a poultry line path;

wetting means disposed along said path for wetting the heads of successive poultry at a discrete region along said path and for wetting said shackle means whereby to enhance electrical continuity between such conveyor shackle means and the feet of poultry engaged thereby;

electrical contact means disposed along another discrete region of said path downstream and electrically insulated from said wetting means for engaging the heads of poultry as they move along said another discrete region of the path; and

electrical current stunning means electrically connected to said electrical contact means and said conveyor shackle means for stunning poultry when their wetted heads engage said electrical contact means.

3,918,124

SEPARATION AND ISOLATION OF A PORTION OF ANIMAL INTESTINE

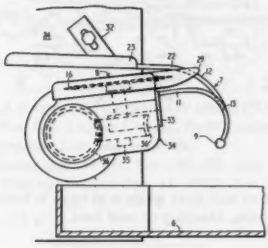
Roy J. Evers, Cronulla, and Darcy Glen Perrett, Peakhurst, both of Australia, assignors to Davis & Geck Australia Pty. Limited, Hurstville, Australia

Filed July 30, 1973, Ser. No. 383,846

Claims priority, application Australia, July 31, 1972, 9905/72

Int. Cl.[2] A22C *17/16*

U.S. Cl. 17—43 **12 Claims**



1. Apparatus for isolating a part of the tubular small intestine of a beast, said apparatus comprising an orientation horn having a leading end and a following end and being composed of at least two rods, which rods form a common joint adjacent the leading end of said horn, said leading end being curved and adapted to receive therearound an initial piece of small intestine tube which has been manually separated from the stomach; a substantially horizontal rotary blade disposed adjacent said following end of said orientation horn; at least one of said rods being affixed to the apparatus above and at least one of said rods being affixed to the apparatus below said substantially horizontal rotary blade, which blade is so positioned in relation to said horn that it severs the intestine tube in a substantially diagonal direction as said intestine tube is pulled over said horn whereby the severed upper portion of said tube incorporating the gold beater strand of the serosa membrane is delivered over and apart from said blade and the remainder of the intestine tube together with the mesentery web, the fatty tissue located between the intestine tube and the stomach, and the stomach falls away below the blade; and a first set of upper and lower rollers in pressure contact with each other, at least one of said rollers having a toothed resilient surface, said rollers being spaced from said horizontal blade and located in a position so that said severed upper portion of the intestine tube may be fed through said rollers whereby the remaining stomach and intestine may be pulled by the action of said rollers into contact with said horizontal blade.

3,918,125

METHOD FOR DISPATCHING POULTRY

Eldon J. Strandine; Mitchell W. Panek, both of Chicago, and John S. Paige, Brookfield, all of Ill., assignors to Swift & Company, Chicago, Ill.

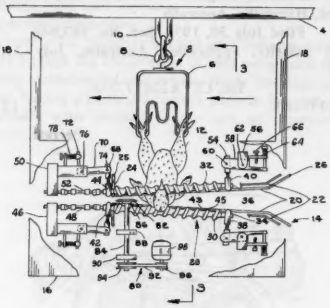
Division of Ser. No. 159,147, July 2, 1971, Pat. No. 3,805,328. This application Dec. 19, 1973, Ser. No. 426,432

Int. Cl. A22b *3/00*

U.S. Cl. 17—45 **5 Claims**

1. A method for dispatching fowl comprising: vertically suspending a fowl by its legs; guiding said fowl's neck into a substantially horizontal alignment; rigidly restraining said

fowl's head in an upright position while maintaining said neck in said horizontal alignment; and making an incision through



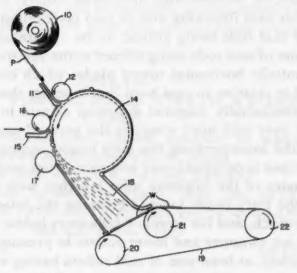
the brainpan of said fowl while said head is being restrained, thereby initiating bleeding of said fowl.

3,918,126

METHOD AND MACHINE FOR FORMING RANDOM FIBER WEBS

Dennis E. Wood, Penfield, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Filed July 12, 1974, Ser. No. 488,055
Int. Cl.² D01G *25/00*
U.S. Cl. 19—156.3 **11 Claims**



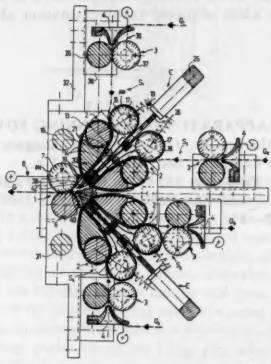
1. The method of forming a random fiber web composed of both short length and long length fibers which comprises feeding sheets of the two types of fibers simultaneously into a rotating lickerin with the sheet of shorter length fibers being fed into the lickerin at a first feed point disposed angularly around the lickerin, in the direction of rotation of the lickerin, in advance of a second feed point at which the sheet of longer length fibers are fed into the lickerin, pneumatically doffing the short fibers into the second feed point to force the short fibers into the longer fibers being fed at the second feed point, thereby forming a blend of the short and long fibers, doffing the blended fibers from the lickerin by an air stream and the centrifugal force produced by the high speed rotation of the lickerin, and conveying the doffed fibers in the air stream to a moving foraminate condenser to deposit them in random fashion on the condenser.

3,918,127

APPARATUS FOR BLENDING ROVINGS

Bruno Amsler, Zeihen, Switzerland, assignor to Braschler & Cie, Zurich, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,820
Int. Cl.² D01H *5/56, 5/70*
U.S. Cl. 19—243 **5 Claims**



1. Apparatus for manufacturing fancy yarns comprising:

at least four drafting feed means for handling respective rovings, each drafting feed means including an intermediate feed mechanism adapted to receive a respective roving;

a final delivery mechanism cooperating with the intermediate feed mechanisms of each of said drafting feed means and arranged subsequently thereof;

a guide mechanism interposed between said intermediate feed mechanisms and said final delivery mechanisms, said guide mechanism being positioned in close proximity to said intermediate feed mechanism, said guide mechanism having a respective guide channel associated with each intermediate feed mechanism for receiving a respective roving therefrom, each respective guide channel terminating in a common guide channel which extends to the nip of said final delivery mechanism;

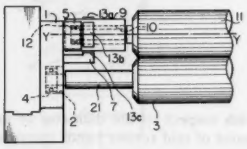
drive means for operating said drafting feed means and said final delivery mechanism, said drive means arranged to drive said final delivery mechanism at a higher peripheral speed relative to said drafting feed means, said drive means comprising a differential, at least a first, second and third coupling, a plurality of change gears operatively connected to said couplings, said first and second couplings operatively connected to a respective intermediate feed mechanism, said third coupling operatively connected to said differential, said differential operatively connected to two intermediate feed mechanisms, and brake means interposed between said differential and each of the said two intermediate feed mechanisms connected thereto; and

control means connected to and selectively actuating said first, second and third couplings and said brake means of said drive means for individually varying the peripheral speed of said at least four drafting feed means from zero to a predetermined maximum during the operation of said apparatus.

3,918,128
DEVICE FOR SETTING THE INTERVENING SPACE BETWEEN A BOTTOM ROLLER AND A TOP ROLLER OF A ROLLER ASSEMBLY

Takashi Katoh, and Yoshiaki Yamaoka, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 18, 1973, Ser. No. 425,932
Int. Cl.² D01H *5/74*
U.S. Cl. 19—260 **5 Claims**



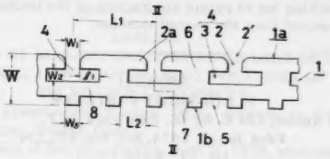
1. In a roller assembly of a spinning machine comprising at least a combination of a fluted bottom roller rotatably supported by a pair of roller stands and a top fluted roller spaced and disposed above said bottom roller with a predetermined very small intervening space between said rollers, and a loading mechanism for urging said top roller toward said bottom roller, a device for setting said intervening space in cooperation with said loading mechanism comprising, a pair of housings, each housing holding a bearing which rotatably supports one end portion boss of said top roller, means for supporting each of said housings in slidable condition toward said bottom roller at an inside position of each roller stand above said bottom roller, a stopper secured to each of said roller stands at an inside position below said supporting means, the extent of the sliding motion of said housing toward said bottom roller being defined by said stopper, intervening gage means having engaging surfaces provided on each of a plurality of longitudinal surfaces of said housing substantially along a longitudinal axis of said top roller and arranged to selectively contact said stopper, which engagement results in the establishment of an intervening space between said top roller and said bottom roller, the distances between each of said engaging surfaces of said gage means and said longitudinal axis of the top roller being respectively different in predetermined amount, whereby said intervening space between said top roller and said bottom roller can be easily changed by engaging said gage means of a desired longitudinal surface of said housing with said stopper under pressure created by said loading means.

3,918,129
PLASTIC TYING BAND

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,592
Claims priority, application Japan, Nov. 21, 1973, 48-130104
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **3 Claims**

1. A tying band molded from plastic material having a suitable resiliency when molded, comprising, integrally, a plurality of axially spaced undercut notches formed with a suitable pitch along one edge of said band, a plurality of outwardly extending axially spaced lands formed along the other edge of said band and a substantially uniform continuous center area left between said notches and said lands, each of said notches including a guide space and a holding space, said guide space having a width not greater than the thickness of said band, said holding space having dimensions large enough to receive substantially all of said center area within the undercut notch, the pitch of said lands being half of the pitch of said notches and acting as abutments on opposite faces of said

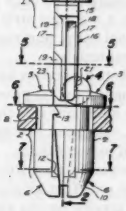


central area when said band is overlapped intermediate its length.

3,918,130
INITIALLY ONE PIECE REMOVABLE FASTENER

L. Richard Poe, Los Angeles County, Calif., assignor to Hartwell Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 436,495, Jan. 25, 1974, abandoned. This application Dec. 11, 1974, Ser. No. 531,732
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 P **12 Claims**



1. A fastener for removably joining a first and a second perforated member, comprising:

a. an expansible grommet having complementary portions joined by a web, the complementary portions including a pair of confronting head portions and stem portions forming spaced confronting walls;

b. opposed expansion cam shoulders adjacent the extremities of the stem portions;

c. a latching lug projecting from at least one confronting wall;

d. an expander plunger including a handle head disposed outwardly of the grommet head portions and a shank dimensioned to fit between the complementary walls;

e. cam elements carried by the shank engageable with the cam shoulders to spread the cam portions upon inward movement relative to the grommet;

f. a channel formed in the shank to receive the latching lug and including a shoulder engageable with the latching lug to restrain outward movement of the plunger;

g. and means initially forming a frangible connection between the head portions of the grommet and the shank of the plunger to hold the plunger in an extended position relative to the grommet until the frangible connection is sheared;

h. the grommet being insertable into the perforated first and second members and the plunger, upon being subjected to a connection shearing force, movable into expanding engagement with the cam shoulders to expand the grom-

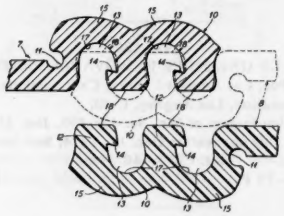
met into interlocking engagement with the first and second members;

i. the plunger thereafter being outwardly movable until engagement between the plunger shoulder and grommet latching lug to permit contraction of the latching lug for removal from the second member.

3,918,131
FLUID-TIGHT FASTENER

Steven Ausnit, 124 E. 61 St., New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,234
Int. Cl.² A44B 19/10
U.S. Cl. 24—201 C **6 Claims**



1. A fluid-tight fastener, comprising:

a pair of flexible closure strips each having a web portion and provided with a marginal strip portion;

at least said marginal strip portions being formed from strongly resilient materials;

one of said marginal strip portions having at least one solid form-retaining longitudinal rib provided with an undercut interlacking tooth along one side thereof thereby forming an enlarged head, said head having a relatively flattened crown surface and arcuate sides;

the other of said marginal strip portions having a longitudinal groove with an undercut longitudinal tooth along one side thereof, said groove having an arcuate root surface, said groove also having arcuate sides generally complementary to said arcuate sides of said head;

said rib being releasably engaged in said groove with said teeth in interlocked engagement and with said arcuate root surface and said crown surface forming a space therebetween;

said rib being wider than the normal width of the groove and causing the groove to expand laterally; and

a bridge of said other marginal strip portion joining the opposite sides of the groove and including said arcuate root surface overlying said crown surface of said rib, said bridge being stretched by the lateral expansion of the groove and thereby reacting under tension to draw said groove sides tightly against the rib;

whereby the rib is sealingly gripped in fluid-tight relation by and between said groove sides.

3,918,132
RUBBER BAND HOLDER

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed Mar. 11, 1974, Ser. No. 450,120
Int. Cl.² A44B 13/00
U.S. Cl. 24—241 SL **6 Claims**

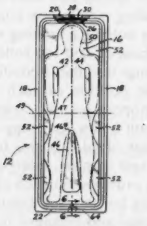
1. A rubber band holder comprising a storage loop for rubber bands, one one of said storage loop having an eye, the other portion of said storage loop having a plain end, said plain end normally projecting through said eye but being retractable for the loading of rubber bands, a head having a hole therein, said head being selectably press fitted on said plain end and removable therefrom, said eye having a large

diameter with respect to the diameter of said plain end to permit removal of said rubber bands through said eye.

3,918,133
CASKET WITH INTERNAL BODY SUPPORTS

Alfred E. Schmitz, Estacada, Oreg., assignor to Charles A. Turenne, Milwaukie, Oreg., a part interest

Filed Apr. 8, 1974, Ser. No. 459,083
Int. Cl.² A61G 17/00
U.S. Cl. 27—2 **4 Claims**

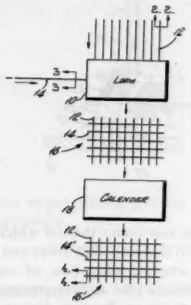


1. A casket comprising an elongate body receiving section having an elongate base wall, spaced-apart head and foot end walls secured adjacent opposite end margins of said base wall and projecting outwardly in one direction therefrom, a pair of elongate spaced-apart side walls secured adjacent opposite longitudinal edge margins of said base wall and projecting outwardly in said direction from said base wall, at least a pair of laterally spaced, substantially rigid body support members secured to and projecting outwardly in said one direction from said base wall, said support members being spaced inwardly from said opposite side walls and from said head end wall, each body support member being disposed intermediate a side wall and the longitudinal centerline of the casket and intermediate the head end wall and the transverse centerline of the casket and adapted to fit under the arms of and between the arms and trunk portion of a body placed in the casket for supporting the same against shifting toward the foot end wall of the casket, and another substantially rigid body support member secured to and projecting outwardly in said direction from said base wall, said other support member being disposed intermediate the transverse centerline and said foot end wall of the casket and substantially centrally between said side walls, with a portion of said other support member facing said head end wall being disposed nearer to said transverse centerline than to said foot end wall adapted to fit between the legs of and to engage the crotch of a body received within the casket further to support the body against shifting toward said foot end wall.

3,918,134
DRAPERY FABRICS AND METHODS OF MAKING THE SAME

William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 4, 1973, Ser. No. 347,934
Int. Cl.² D06C *15/00*; D03D *15/00*
U.S. Cl. 28—72 FT 4 Claims

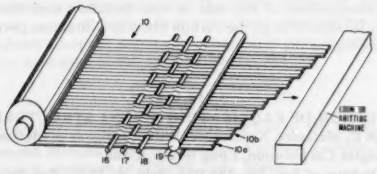


1. A method of forming a stabilized open-weave drapery fabric having excellent surface coverage, high color intensity and low light penetration per unit weight consisting of the following steps in the sequence set forth: weaving an open-weave drapery fabric from (1) a warp containing from about 16 to about 24 ends per inch of relatively flattened oval strip saran having an average thickness of from about 1½ mils to about 3 mils and an average width of from about 20 mils to about 35 mils and (2) a filling of substantially round mod-acrylic yarns having a yarn size of from 8/1 to about 4/1 cotton count, there being about 12 to about 16 picks per inch; and calendering said open-weave drapery fabric at elevated temperatures of from about 250°F to about 350°F and under pressures of from about 20 tons to about 100 tons per 48 inches of fabric width as to soften, mold and flatten the filling yarns.

3,918,135
METHODS OF MAKING FABRICS FROM SYNTHETIC TAPES

Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 17, 1973, Ser. No. 397,489
Int. Cl.² D03D *41/00*, *15/00*
U.S. Cl. 28—72 CS 2 Claims

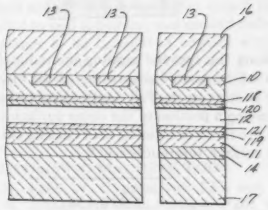


1. A method of making fabrics comprising:
providing a supply roll of a longitudinally oriented synthetic sheet having longitudinal striations embossed therein forming alternating relatively thick longitudinal ribs and relatively thin longitudinal webs;
advancing said sheet from said supply roll;
initially separating a portion of said sheet into a plurality of tapes of a desired width;
advancing adjacent tapes in diverging directions vertically away from each other while maintaining tension in the longitudinal direction uniformly across said sheet to tear the webs between said adjacent tapes; and
continuously feeding said tapes into a fabrication machine to form a fabric therefrom.

3,918,136
METHOD OF MAKING GASEOUS DISCHARGE DEVICE HAVING LOWER OPERATING VOLTAGES OF INCREASED UNIFORMITY

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 70,523, Sept. 8, 1970, abandoned.
This application Aug. 6, 1973, Ser. No. 385,974
Int. Cl.² H01J *9/00*
U.S. Cl. 29—25.11 2 Claims



1. In the method of manufacturing a gaseous discharge panel characterized by an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material charge storage members which are respectively backed by a series of parallel-like electrode members, the electrode members being transversely oriented with respect to the electrode members behind the opposing dielectric material storage members so as to define a plurality of discrete discharge volumes constituting a discharge unit, and wherein the gas is selectively ionized within each discharge unit by operating voltages applied to the transversely oriented electrode members, the improvement comprising:
a. depositing on the charge storage surface of each dielectric member a first layer of at least one oxide selected from the group consisting of aluminum oxide, titanium oxide, zirconium oxide, hafnium oxide and silicon oxide, said deposited layer having a thickness of at least about 200 angstrom units;
b. and depositing a second layer consisting of lead oxide, said second layer having a thickness of at least about 200 angstrom units.

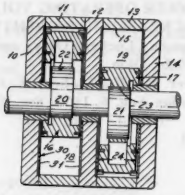
3,918,137
WEAR-RESISTANT COATING FOR ROTARY ENGINE SIDE HOUSING AND METHOD OF MAKING

Yeshwant P. Telang, Grosse Ile, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 376,861, July 5, 1973, Pat. No. 3,833,321.
This application May 3, 1974, Ser. No. 466,655
Int. Cl.² B23P *15/00*, *17/00*
U.S. Cl. 29—156.4 WL 9 Claims

1. A method of making a wear-resistant surface for use in a rotary internal combustion engine having a rotor with apex seals, the method comprising:
a. casting a flat supporting surface comprised of cast iron, said surface being milled to serve also as a reference,
b. removing a portion of said surface below said milled surface to a depth of between 0.013 to 0.017 inches and within at least an area defined by the projection of the path of the outermost point of the apex seal,
c. thermally spraying a wear-resistant coating comprised of an admixture of generally equally hard particles, one

particle consisting essentially of a martensitic stainless steel and the other consisting essentially of a nickel-based alloy containing about 3–4% each of boron and silicon, said particles being applied uniformly across said machined portion, said spray coating being deposited in a thickness no thinner than 0.2 inches and less than 0.03 inch,



d. soaking the sprayed coating immediately after spraying with oil to permit absorption of oil into the porosity of said coating to the full depth of said coating, and

e. removing a portion of the outer surface of said coating so that the finish contour of said coating surface is flush with said surface reference.

3,918,138

METALLURGICAL COMPOSITION EMBODYING HARD METAL CARBIDES, AND METHOD OF MAKING

Bela J. Nemeth, and Alden M. Burghardt, both of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed June 20, 1973, Ser. No. 371,598

Int. Cl.[2] B22F *1/00*

U.S. Cl. 29—182.7 **15 Claims**

1. A method of making a sintered carbide product which comprises milling together a mixture comprising a major part tungsten carbide, titanium, about 10 weight % nickel, compacting the milled mixture, and sintering the compacted milled mixture to form the product, the said titanium being added to the mixture calculated in an amount to decarburize the tungsten carbide to a degree which will release tungsten to form an alloy with the nickel up to about 28 weight % tungsten in the alloy.

3,918,139

MCrAlY TYPE COATING ALLOY

Edward J. Felten, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 10, 1974, Ser. No. 487,074

Int. Cl.[2] B32B *15/04*; C22C *19/00*

U.S. Cl. 29—194 **7 Claims**

5. A coated article comprising a nickel-base or cobalt-base superalloy, and an overlay coating thereon of the MCrAlY type wherein the coating composition consists essentially of, by weight, approximately 8–30 percent chromium, 5–15 percent aluminum, up to 1 percent reactive metal selected from the group consisting of yttrium, scandium, thorium and the other rare earth elements, 3–12 percent of a noble metal selected from the group consisting of platinum or rhodium, balance selected from the group consisting of nickel, cobalt and nickel-cobalt, said platinum or rhodium being substantially uniformly dispersed throughout said overlay coating.

3,918,140

SNAP-FASTENER SETTING TOOL

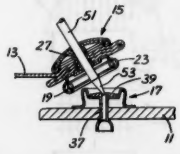
Anthony N. Konstant, 902 W. Gregory, Mount Prospect, Ill.

Filed Apr. 29, 1974, Ser. No. 464,854

Int. Cl.[2] B25B *27/14*; A44B *17/00*

U.S. Cl. 29—271 **8 Claims**

1. In combination, a pair of mating snap fasteners having connecting parts of generally circular shape, one of said fasteners being adapted for mounting to a fixed object and having aperture means disposed concentrically therein and the other of said fasteners being adapted for mounting to a cover or the like and containing a hole disposed concentrically therein and extending completely therethrough, and a setting tool having a handle, a shank connected to said handle, and pin means extending from said shank, said pin means having a lower end sufficiently small to fit into said aperture means and smaller in



cross section than the remainder thereof which is larger than said aperture means so that only said lower end thereof can be inserted thereinto, whereby insertion of said pin means through said hole and into said aperture means facilitates the mating of said snap fasteners because leverage obtained by movement of said handle easily stretches the cover and brings said snap fastener connecting parts into alignment.

3,918,141

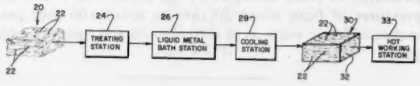
METHOD OF PRODUCING A GRAPHITE-FIBER-REINFORCED METAL COMPOSITE

Roger Thomas Pepper, Cape Elizabeth, and Frank Bucherati, Bridgton, both of Maine, assignors to Fiber Materials, Inc., Biddeford, Maine

Filed Apr. 12, 1974, Ser. No. 460,563

Int. Cl.[2] B23P *17/04*

U.S. Cl. 29—419 R **13 Claims**



13. Method of aligning reinforcing carbon fibers in a precursor formed of a mat of substantially randomly oriented carbon fibers impregnated with a metal,

comprising working said precursor at a temperature in the range between a minimum of not more than about 50°C below the solidus temperature and a maximum just below the liquidus temperature of the metal, to reduce the cross-section of the mat in one direction and thereby substantially align the carbon fibers in a direction perpendicular to the direction of reduction.

3,918,142

METHOD OF FABRICATING A VENT STRUCTURE

Joseph C. McGuire, Kennewick, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 394,054, Sept. 4, 1973, Pat. No. 3,838,557. This application Mar. 29, 1974, Ser. No. 456,183

Int. Cl. B22f *3/24*

U.S. Cl. 29—420 **7 Claims**

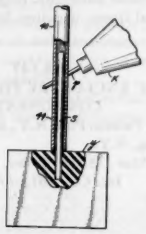
1. A method of fabricating a vent structure, which comprises the steps of:

placing a normally upper portion of a ductile thin-walled tubing of predetermined length and size over and about an upright rod of predetermined diameter and length mounted on a base;

adding a predetermined amount of fine separating particles into said tubing;

vibrating said tubing to pack said particles therein down around said rod;

withdrawing said rod to leave a layer of said particles in said upper tubing portion; and



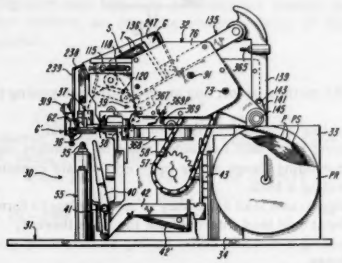
flattening said upper tubing portion at a predetermined flattening pressure.

3,918,143

TAG FEEDING AND ATTACHING METHOD

Harold N. Grushon, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 320,340, Jan. 2, 1973, Pat. No. 3,837,554.
This application Apr. 1, 1974, Ser. No. 456,712
Int. Cl.² B65H *5/00*
U.S. Cl. 29—429 **3 Claims**



1. Method of attaching tags to merchandise wherein the tags can have any one of a variety of predetermined lengths, comprising the steps of: manually triggering a tag attaching apparatus to initiate each tag attaching cycle, continuously driving endless feed means throughout a tag attaching cycle so that the feeding of a tag in a waiting position in frictional contact with the endless feed means toward an attaching zone starts at the beginning of the cycle and the tag is delivered to the attaching zone irrespective of the length of the tag, attaching the tag to merchandise during the cycle, and feeding another tag from a hopper to the waiting position near the end of the cycle by means of the endless feed means.

3,918,144

BONDING EQUIPMENT AND METHOD OF BONDING

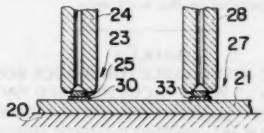
Tsutomu Mimata, Tokyo, and Ryozo Yuzawa, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 25, 1974, Ser. No. 454,663
Claims priority, application Japan, Apr. 6, 1973, 48-38729
Int. Cl.² B23K *5/22, 31/02*
U.S. Cl. 228—205 **11 Claims**

1. Bonding equipment which bonds a pellet to the upper surface of a substrate, which is displaced intermittently, during a stationary state thereof, comprising:

first means, including a first collet to be brought in contact with the peripheral edges of said pellet, at a first station relative to which said substrate is displaceable, for scrubbing said pellet to said substrate, to effect an initial bonding of said pellet to said substrate; and

second means, including a second collet, adapted to be mechanically coupled with said pellet at a second station separated from said first station in the direction that said substrate is displaceable relative to said first station, for



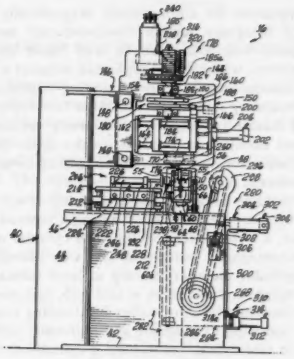
correcting a mounting position of said pellet on said substrate, said second means including means for scrubbing said pellet to said substrate, said second collet having pyramidal planes to be brought in contact with the peripheral edges of said pellet which are formed into oblique planes sharper than pyramidal planes of said first collet at said first station.

3,918,145

AUTOMATIC MACHINE TOOL

Frank R. Oglivie, 1205 W. Cypress No. 122, and Peter J. Kalman, 615 W. Allen, both of San Dimas, Calif. 91773

Filed July 8, 1974, Ser. No. 486,484
Int. Cl.² B23P *23/02*
U.S. Cl. 29—564 **8 Claims**



1. A machine tool comprising:

a frame,

means on said frame for supporting a workpiece for movement along a given path and rotation about a given axis, machining means on said frame along said path for performing selected machining operations on the workpiece, first work positioning means for intermittently feeding the workpiece to successive positions along said path,

second work positioning means for intermittently rotating the workpiece to successive positions about said axis,

said work positioning means being operable in timed relation to locate the workpiece in selected successive work positions relative to said machining means,

means for operating said work positioning means and machining means in timed relation to locate the workpiece in said work positions in sequence and in each work position to perform one of said machining operations on the workpiece,

said machining means comprising a plurality of rotary cutters including a milling cutter, a drill, and a cutoff saw,

operable on the workpiece sequentially in its work positions, respectively, means for driving said cutters in rotation, and means supporting said cutters for movement along prescribed paths into and from cutting engagement with the workpiece, and

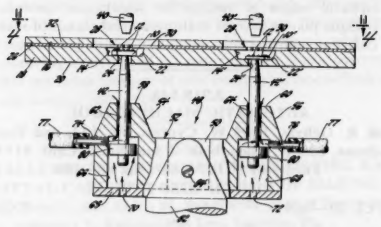
said operating means comprises means for moving each cutter along its prescribed path upon movement of the workpiece to the work positions, in which the respective cutter is operable on the workpiece.

3,918,146

MAGNETIC SEMICONDUCTOR DEVICE BONDING APPARATUS WITH VACUUM-BIASED PROBES

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1974, Ser. No. 502,233
Int. Cl.² B01J 17/00
U.S. Cl. 29—569 **2 Claims**



1. An apparatus for automatically magnetically aligning a plurality of integrally leaded semiconductor device chips simultaneously with a conductive lead frame structure for bonding thereto, wherein the apparatus includes a soft ferromagnetic elongated vertically extending support member, means surrounding said support member for supplying a magnetic field thereto, means for successively vertically raising said support member, and means on the upper part of said support member for receiving a probe holding device, wherein the improvement comprises:

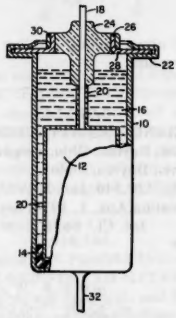
a probe holding device having a plurality of soft ferromagnetic cylinder members each having a tapered upper end portion, a web interconnecting said cylinder members, a nonferromagnetic portion in said web between each of said cylinder members having at least substantially the same height and thickness as said web, said nonferromagnetic portion providing means for dividing magnetic flux from said support member and uniformly concentrating them in said cylinder members, a cylindrical chamber in each of said cylinder members, a vertical bore extending from the tapered upper end portion of each cylinder member down to the top of each of said chambers, a vacuum port in the upper portion of each of said chambers, a source of vacuum, means for communicating said source of vacuum with each of said ports, an opening in the bottom of each of said chambers for exposing the lower portion of said chambers to atmospheric pressure, an elongated soft ferromagnetic probe in each of said bores, said probe being longer than said bore and having upper and lower ends, the upper end of said probe extending upwardly above said cylinder member and said lower end of said probe extending into said chamber, said probe having a transverse dimension slightly smaller than the corresponding transverse dimension of said bore wherein ambient air can be drawn into the upper portion of said chamber by said vacuum to produce an air-bearing effect between said probe and said bore, each of said probes being tapered at its upper end for easy insertion into a chip carrying apparatus and for further concentrating said magnetic flux, and a nonferromagnetic collar on the lower end of each of said probes below said vacuum port providing an enlarged surface for said probes wherein air drawn into said chambers through each of said chamber bottom openings upwardly biases said probes so that they may each simultaneously carry a chip into more precise automatic magnetic alignment with an overlying lead frame structure for bonding.

3,918,147

HERMETIC ENCLOSURE FOR ELECTRONIC COMPONENT

Andrew Herczog, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,289
Int. Cl.² B01J 17/00
U.S. Cl. 29—570 **16 Claims**



1. The method of forming an enclosure comprising the steps of

providing a silver container open at one end,

forming from said container material a unitary outwardly protruding flange at the open end of said container,

providing a lead,

sealing to said lead a quantity of sealing glass to form a bead about said lead intermediate the ends thereof,

providing a metallic collar having an outwardly protruding flange,

disposing said collar about said bead,

providing a metallic band having a temperature coefficient of expansion greater than said glass bead,

heating said metallic band, collar and glass bead,

disposing said metallic band about said collar so as to place said collar and glass bead in compression upon cooling thereby effecting a compression seal between said collar and said glass bead,

providing an article to be enclosed in said container,

disposing said article in said container,

disposing the outwardly protruding flange of said collar adjacent the outwardly protruding flange of said container, and

hermetically sealing said outwardly protruding flange of said collar to the outwardly protruding flange of said container.

3,918,148

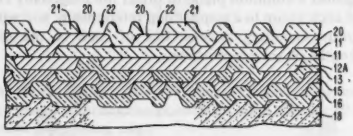
INTEGRATED CIRCUIT CHIP CARRIER AND METHOD FOR FORMING THE SAME

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,078
Int. Cl.² B01J 17/00
U.S. Cl. 29—576 **21 Claims**

1. A method for forming an integrated circuit chip carrier comprising

forming on a substrate, a primary layer which has a chemical etchability different from that of said substrate and is electrically insulative with respect to subsequently applied metallization patterns,
forming a first level metallization pattern on the exposed surface of said primary layer,
forming over said metallization pattern and said surface, a first covering layer of dielectric material,
forming on said first covering layer, at least one additional level metallization pattern,
forming over each additional level metallization pattern, an additional covering layer of dielectric material,



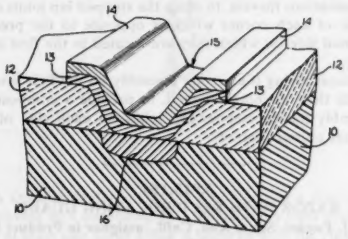
forming a supporting base on the last formed additional covering layer,
removing said substrate with a chemical etchant which preferentially etches said substrate to expose the other surface of said primary layer,
forming at said other surface, an opposite level metallization pattern, and
forming over said opposite metallization pattern and said other surface, an opposite covering layer of dielectric material.

3,918,149

AL/SI METALLIZATION PROCESS

Gary Roberts, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed June 28, 1974, Ser. No. 484,071
Int. Cl.² B01J *17/00*
U.S. Cl. 29—580 **7 Claims**



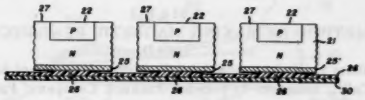
1. A method for forming a contact to a region in a semiconductor substrate through an insulating layer comprising the steps of:
a. forming a contact window in the insulating layer;
b. depositing a layer of silicon over the insulating layer;
c. depositing a conductive layer over the silicon layer;
d. defining a pattern in said conductive layer;
e. defining a pattern in said silicon layer by plasma etching with freon gas; and
f. homogenizing the remaining silicon and conductive layers into an alloy by heating.

3,918,150

SYSTEM FOR SEPARATING A SEMICONDUCTOR WAFER INTO DISCRETE PELLETS

Francis C. Gantley, Fulton, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,834
Int. Cl.² B01J *17/00*
U.S. Cl. 29—583 **9 Claims**



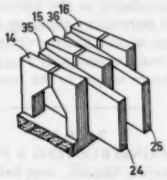
1. A method of manufacturing semiconductor devices comprising the steps of:
providing a semiconductor wafer which defines two major surfaces and has been diffused so as to form, upon subdivision, a plurality of semiconductor pellets;
adhering to one of said major surfaces a layer of ductile variable coupling material, said ductile material being applied as a liquid and then cured;
affixing to said coupling material a stretchable membrane that adheres to said coupling material more strongly than said coupling material adheres to said wafer;
subdividing said wafer;
stretching said membrane in all directions so as to separate said pellets while maintaining the same relative orientation among said pellets; and
removing said pellets from said wafer.

3,918,151

METHOD OF MANUFACTURING A MULTIPLE MAGNETIC HEAD

Arie Bol; Johannes van Ginkel; Andrianus Henricus Maria Van Der Schoot, and Petrus Henricus Swaanen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 234,713, March 15, 1972, Pat. No. 3,768,154. This application Aug. 13, 1973, Ser. No. 387,687
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **1 Claim**



1. A method of manufacturing a multiple magnetic head for magnetic data recording having at least two cores of a magnetizable material, each constituting a substantially closed path for magnetic flux, said cores being separated from each other by a spacing and screening member, the method comprising the steps of:
A. placing at least two mouldings of a magnetizable material, having machined surfaces thereon, adjacent each other with their machined surfaces facing each other;
B. cementing said mouldings to form an assembly;
C. laterally cutting through the assembly to provide at least one lateral cut space for a spacing and screening member;
D. placing a screening and spacing member in the pro-

vided space of step (C) at an angle to said lateral cut space so as to prevent unilateral engagement of said screening and spacing member against a wall of said space, thereby providing cementing spaces on both sides of said screening and spacing member, and

E. cementing said spacing and screening member in said lateral cut space by drawing adhesive into said cementing spaces by capillary action.

3,918,152

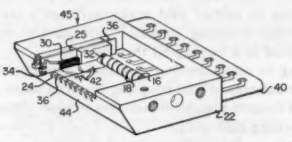
METHOD OF MAKING MAGNETIC READ-RECORD HEAD

William I. Girdner, and John H. Miller, III, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 405,943, Oct. 12, 1973. This application Feb. 24, 1975, Ser. No. 552,399

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 **5 Claims**



1. A method for making an electromagnetic read-record head comprising the steps of:

providing a first cylindrical member having a cylindrical cavity open at one end of the member;

providing a second cylindrical member having first portion with a first diameter to provide a locator bar and a second portion at an end of the first portion with a second larger diameter approximately equal to the diameter of the cylindrical cavity;

fastening the second cylindrical member within the cylindrical cavity of the first cylindrical member;

removing a portion of the first and second cylindrical members along surfaces substantially parallel to the locator bar and exposing the cylindrical cavity, thereby producing a transducer frame;

providing a plurality of electromagnetic transducers having a transducing core with a notch and with a coil surrounding a portion of the transducing core;

placing each transducer in the transducer frame with the notch in each transducer engaging the locator bar;

providing return means for providing a magnetic return path for the transducers; and

attaching the return means to the transducer frame.

3,918,153

METHOD OF CONSTRUCTING A MAGNETIC CORE

Charles E. Burkhardt, Sharon, and Belvin B. Ellis, Pulaski, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1971, Ser. No. 126,632

Int. Cl.² H01F *41/02*

U.S. Cl. 29—609 **7 Claims**

1. A method of constructing a magnetic core of the stacked type, comprising the steps of:

providing a strip of metallic, magnetic material having a predetermined width dimension,

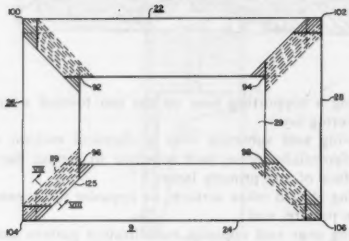
diagonally cutting the strip across its complete width dimension at predetermined spaced locations to provide a plurality of substantially trapezoidal shaped leg laminations having like length dimensions and a plurality of substantially trapezoidal shaped yoke laminations having like length dimensions,

incrementally clipping only one end of the leg laminations to provide a predetermined number of leg laminations having different maximum length dimensions,

incrementally clipping only one end of the yoke laminations to provide a predetermined number of yoke laminations having different maximum length dimensions,

stacking the leg laminations to provide a plurality of similar groups, with the clipped ends of each group being against a common plane to offset the diagonally cut ends of each group in a stepped-lap relationship, and with each group including at least one of each of the different lengths of leg laminations,

stacking the yoke laminations to provide a plurality of similar groups, with the clipped ends of each group being against a common plane to offset the diagonally cut ends of each group in a stepped-lap relationship, and with each group including at least one of each of the different lengths of yoke laminations,



assembling two of the stacked groups of leg laminations and two of the stacked groups of yoke laminations to provide a first substantially rectangular assembly having an opening therein, with the diagonally cut ends of the leg and yoke laminations butting to provide diagonal corner joints having a stepped-lap pattern on a predetermined side of each corner of the first assembly, and with the clipped ends of each group adjacent unclipped ends of another group,

providing a second assembly of groups of leg and yoke laminations which is similar to the first, except in 180° rotational symmetry therewith, about an axis of the first assembly which is parallel with the major planes of the laminations therein, to place the stepped-lap joints on the side of each corner which is opposite to the predetermined side on which they are located in the first assembly,

and superposing the second assembly on the first assembly with their openings aligned, to provide a composite assembly having stepped-lap joints on each side of each outer corner thereof.

3,918,154

RAZOR WITH RECIPROCATING GUARD

Alfred J. Pagani, Santa Ana, Calif., assignor to Product Development I, Santa Ana, Calif.

Filed Aug. 6, 1973, Ser. No. 385,872

Int. Cl.² B26B *19/42*, *19/28*

U.S. Cl. 30—34.2 **11 Claims**

11. A combination comprising:

a body, at least a portion of said body being adapted to be manually grasped to allow manual movement of the body;

a blade having a sharp cutting edge;

means for mounting the blade on the body with the sharp cutting edge exposed and with the blade being fixed against reciprocation relative to said body;

a guard having a plurality of openings therein;

means for mounting said guard on said body for reciprocatory movement relative to said body and said blade, said

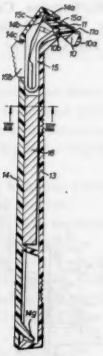
openings being adjacent said cutting edge; and

motor means for imparting said reciprocatory movement to said guard whereby the guard can move the hair to be cut across the cutting edge.

3,918,155
SHAVING DEVICES

Colin A. Atkins, Staines, England, assignor to Wilkinson Sword Limited, Buchinghamshire, England

Filed May 7, 1973, Ser. No. 358,101
Claims priority, application United Kingdom, May 16, 1972, 22939/72
Int. Cl.² B26B *21/30, 21/52, 21/54*
U.S. Cl. 30—47 **3 Claims**



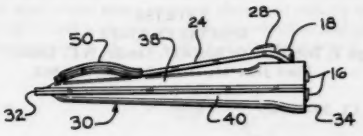
3. A shaving device including a holder and a shaving unit, said shaving unit consisting of a substantially rigid member to which at least one razor blade is secured with the rigid member having a guard surface located at a pre-set spacing from the cutting edge of the blade,

said holder including ejecting means for ejecting a shaving unit from said holder when the shaving unit is to be replaced, said ejecting means having two coupled limbs, the free end of one limb carries an ejector button by which pressure is applied, via the free end of said one limb, to the rear of the shaving unit to be ejected, and the free end of the other limb forming a latch which secures said shaving unit in the holder, the application of pressure to the rear of the shaving unit by the free end of said one limb causing said latch to move out of engagement with the shaving unit thereby permitting ejection of said shaving unit.

3,918,156
NAIL RETAINING CUTTER

Henry H. Merriman, 751 W. Washington Ave., Jackson, Mich. 49203

Filed Jan. 21, 1974, Ser. No. 435,278
Int. Cl.² A45D *29/20*
U.S. Cl. 30—151 **4 Claims**



1. A fingernail clipping retaining cutter comprising, in combination, a nipper including a pair of elongated superimposed spring cutting elements having first and second ends adjacently disposed relative to each other and having lateral edges, means affixing said elements together adjacent said first end, said second ends being biased away from each other, cooperating cutting edges defined on said second ends, a post extending through said elements adjacent said second ends, an operating lever pivotally mounted on said post and having a fulcrum engaging one of said elements for forcing said second ends and said cutting edges toward each other, and an elongated sheath formed of flexible material of a closed configuration throughout its length and of a continuous transverse periphery defined by said flexible material defining a pocket closely and frictionally receiving said elements along the length and lateral edges thereof, said material having a relatively high coefficient of friction with respect to said elements, said sheath having a closed end adjacent said elements' first end and having an open end located adjacent said cutting edges defined by sheath edges, a recess defined in said sheath intersecting a sheath edge receiving said post, said sheath pocket having a length greater than the length of said elements, said nipper being longitudinally slidable within said pocket to retract said cutting edges with respect to said open end sheath edges to a non-cutting position and extend said cutting edges adjacent said sheath edges to a cutting position, said sheath frictionally engaging said elements to selectively maintain the longitudinal position of said nipper within said sheath pocket.

3,918,157
SAFETY KNIFE

Raymond Theodore Hyba, Mt. Clemens, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed July 2, 1974, Ser. No. 485,197
Int. Cl.² B26B *11/00*
U.S. Cl. 30—287 **8 Claims**

1. A safety knife comprising:

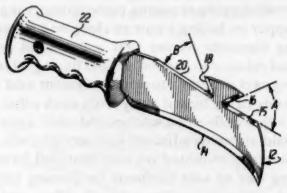
a cutting blade having a cutting edge to perform a cutting function;

two guards, one guard disposed on each side of said cutting blade, substantially parallel to said cutting blade, said knife having a space between at least a portion of each guard and at least a portion of said blade, said guards being flat elongated members to prevent said cutting edge of said blade from injuring the user of the safety knife;

a handle disposed at one end of said cutting blade and guard, said handle being adapted to be gripped by the user of said safety knife; and

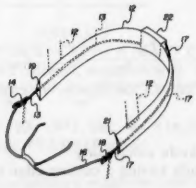
said blade and said guards each having a trailing edge, said guards having an inset portion at said guard trailing edge, said guard trailing edge at said inset portion being recessed with reference to said trailing edge of said blade, a portion of said trailing edge of said cutting blade extending above the recessed portion of said trailing edge of said guards to provide a useful scraping surface.

3,918,158
SPECIALTY KNIFE
Joseph Z. Debski, P.O. Box 427, Lenoir, N.C. 28645
Filed June 13, 1974, Ser. No. 478,862
Int. Cl.[2] B26B *3/08*
U.S. Cl. 30—314 **3 Claims**



1. A specialty knife particularly suitable for cutting linoleum and pliable sheet material, wherein said knife has a curved blade having a concave and convex side, said concave side having a cutting edge terminating in a pointed end at the junction with the convex side, the improvement comprising said convex side having an angled double-bladed cutting edge radiating from the apex of the angle on the forward side of said convex side positioned at about the area of lowest radius of curvature thereby positioning said double-bladed cutting edge for operation by forward pushing of said knife, said convex side having a second angled double-bladed cutting edge radiating from the apex of the angle in mirror relationship to said forward facing double-bladed cutting edge, said second cutting edge being positioned closer to the handle for said knife and positioned for operation by drawing said knife toward the operator, both of said angled blades forming open angles of 20° to 65°.

3,918,159
ORTHODONTIC APPLIANCE FORCE EQUALIZER
Lawrence F. Andrews, San Diego, Calif., assignor to Lawrence F. Andrews, San Diego, Calif.
Filed Aug. 24, 1973, Ser. No. 391,129
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 D **1 Claim**



1. An orthodontic appliance force equilizer for equalizing the tension on an orthodontic appliance such as a conventional face bow comprising:

a housing;

a reel assembly rotatably mounted within said housing;

first and second lines coiled on said reel assembly, said first and second lines adapted for coupling to an orthodontic appliance;

a spindle carried by said housing concentric with said reel assembly;

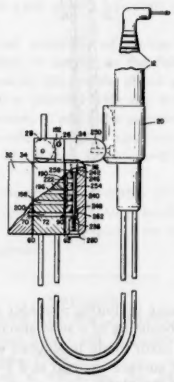
a coil spring disposed within said reel assembly, said coil spring having an inner end coupled to said spindle and an outer end attached to said reel assembly; and

said reel assembly consists of first and second reels with said first and second lines coiled thereon, respectively, said first and second lines being coiled in opposite directions; said spindle being fixedly attached to one of said first and second reels and rotatably coupled to said housing; and said outside end of said spring being attached to another of said first and second reels.

3,918,160
COATING AND METHOD FOR MARKING TEETH
Abraham Friedman, 2205 E. 27th St., Brooklyn, N.Y. 11229
Filed July 9, 1973, Ser. No. 377,631
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—19 **3 Claims**

1. Method of marking tooth contact points on occlusion, comprising the step of applying a pressure sensitive coating to at least one of two opposing occluding teeth, said coating including a plurality of dispersed cells each containing a one of two chemically interactive substances, said cells being rupturable in response to application of occlusal pressure thereto, whereby the substances of the ruptured cells chemically interact and produce localized stained areas at locations of premature tooth contact points between upper and lower teeth.

3,918,161
DENTAL TOOL CONTROL ASSEMBLY
Ward Morgan, Belmont; Gerald H. Weiner, Hillsborough, and Ronald D. Raff, Millbrae, all of Calif., assignors to Health Kit Corporation, Burlingame, Calif.
Filed Apr. 13, 1973, Ser. No. 351,052
Int. Cl. A61c *19/02*
U.S. Cl. 32—22 **23 Claims**



1. Apparatus for controlling the supply of dental fluids from various dental fluid sources to a plurality of dental tools comprising:

a laminated control block having, in series, a manifold lamina, a valve lamina, and a pilot lamina, a plurality of grooves being formed at the interface between the manifold lamina and the valve lamina,

said manifold lamina in fluid communication with the various dental fluid sources and adapted to supply the dental fluids to the respective grooves,

said valve lamina having a plurality of sets of internal passages, each set associated with a particular dental tool and each passage thereof providing fluid communication from one of the respective grooves to the face of the valve lamina adjacent the pilot lamina and from said face to apertures adapted to be fluidly connected to the associated dental tool,

said pilot lamina having a plurality of valve means, each said valve means associated with a particular dental tool and adapted to control fluid passage through the associated passages in the valve lamina from the manifold lamina to the apertures.

3,918,162

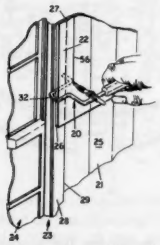
BLIND SCRIBER

Roland J. Houle, S. Shore Road, Salem, N.H. 03079

Filed June 10, 1974, Ser. No. 477,895

Int. Cl.² B43L *13/02*

U.S. Cl. 33—41 R **1 Claim**



1. A blind scriber for marking on one face of a wall panel while guided from the other face thereof, said scriber comprising:

an elongated, one piece, metal rod shank having an intermediate portion bent into U-shaped configuration to define a work receiving recess and including a rear leg, a front leg parallel to said rear leg and a bight portion connecting said legs;

an integral guide portion bent outwardly from the end of said rear leg and normal thereto;

an integral spacing portion bent outwardly from the end of said front leg and normal thereto,

an integral support portion bent from the end of said spacing portion, into parallelism with said front and rear legs and extending beyond said guide portion, on the opposite side thereof from said U-shaped intermediate portion, to form a handle portion;

a hand grip on said handle portion;

a pair of clamping jaws on said handle portion, located between said grip and said spacing portion, and

a scriber slidably mounted in said clamping jaws and precisely, axially aligned with said guide portion, for movement toward and away therefrom to mark a panel located in said recess.

3,918,163

DISTANCE MEASURING DEVICES

Francis J. Keating, Lake Forest, Ill., assignor to Francis J. Keating, Lake Forest, Ill.

Continuation-in-part of Ser. No. 436,869, Jan. 28, 1974, abandoned. This application July 5, 1974, Ser. No. 485,894

Int. Cl.² G01B *3/12*

U.S. Cl. 33—142 **25 Claims**

1. A distance measuring device for use with different scale maps, comprising:

an input wheel for following a path to be measured along the map;

a drive wheel connected to said input wheel and rotatably driven by said input wheel, and including a flat surface;

a main axle on which said drive wheel is mounted and about which said drive wheel rotates;

a scale wheel rotatable at approximately a right angle to and driven by the flat surface of said drive wheel;

a scale axle approximately parallel to the flat surface of said drive wheel which is rotatably driven by said scale wheel, said scale wheel being mounted about and slidably connected to said scale axle to allow movement of said scale wheel parallel to the flat surface of said drive wheel;

an output indicator journalled on said main axle and drive means coupled between said output indicator and scale axle, said scale axle including, an output readout register; and

a housing for said wheels and axles, said housing having an interior area coplanar with said drive wheel and including an input wheel opening to allow said input wheel to extend beyond the housing and contact the map, a scale wheel opening to allow access to said scale wheel to slide said scale wheel along said scale axle, and means for viewing the output readout register said drive wheel substantially filling said interior area of the housing and said main axle being generally centrally located in the housing.

3,918,164

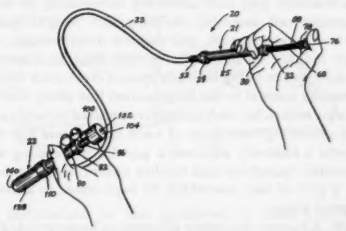
MEASURING DEVICE HAVING REMOTE INDICATING MEANS

Edmund J. Krautmann, 403 S. Washington, Chillicothe, Mo. 64601

Filed Aug. 10, 1972, Ser. No. 279,498

Int. Cl.² G01B *5/02*

U.S. Cl. 33—143 C **8 Claims**



1. A hydraulic measuring device for measuring the pelvic dimensions of cattle comprising a receiver having an elongated cylinder and elongated piston extending from one end of the cylinder, the piston and cylinder defining a first chamber therebetween for receiving hydraulic fluid, the receiver being dimensioned to grasp in the palm of one hand with the fingers curled around its sides and further dimensioned to fit end first along with the hand in which it is held through the anal sphincter of the animal, the end of the cylinder opposite the piston defining a first butting surface and the end of the piston opposite the cylinder defining a second butting surface, a recorder having a piston and cylinder combination defining

a second chamber therebetween for receiving hydraulic fluid, flexible tube means connected between the recorder and the side of the receiver and communicating the first chamber with the second chamber, whereby movement of one piston relative to its cylinder produces movement of the other piston relative to its cylinder, and measurement indicating means associated with the recorder and responsive to recorder piston position for indicating the distance between butting surfaces of the receiver, the flexible tube being of sufficient length to extend through the anal sphincter of the animal with the receiver held in one hand in position inside the animal for measuring its pelvic dimension and the recorder located outside the animal, whereby with the receiver properly positioned for making pelvic measurements, the recorder is easily accessible for remote operation of the receiver and direct measurement of the distance between the butting surfaces of the receiver.

3,918,165

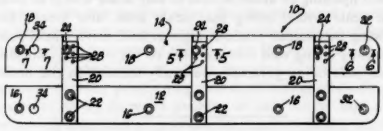
LOCATOR ASSEMBLY FOR MOUNTING MEMBERS FOR ROTARY GAP BRIDGING AND SEALING DEVICES

Daniel E. Czernik, Hinsdale, and Clarence H. Neff, Skokie, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Division of Ser. No. 287,595, Sept. 11, 1972, Pat. No. 3,843,273. This application Apr. 25, 1974, Ser. No. 464,070

Int. Cl.[2] E01C *23/00*; **E01D** *19/06*; **B23B** *47/28*

U.S. Cl. 33—174 G **11 Claims**



8. A locator assembly adapted to be suspended on a roadway over a roadway gap for locating the longitudinal and transverse spaced positions for anchoring members for securing roadway gap sealing and bridging devices and for suspending the anchoring members while they are secured adjacent the roadway gap, said assembly comprising an elongate gap spanning rail assembly defining first longitudinally spaced anchor locator means and second longitudinally spaced anchor locator means, pairs of said first and second anchor locator means being laterally spaced from each other on a line generally normal to the longitudinal line along which said first locator means lie, and outriggers secured to said rail assembly and extending outwardly of each side of said rail assembly to overlie a roadway adjacent a gap for suspending said locator assembly therefrom and further comprising means for securing a pair of like assemblies to each other in a longitudinally aligned array.

10. A locator assembly adapted to be suspended on a roadway over a roadway gap for locating the longitudinal and transverse spaced positions for anchoring members for securing roadway gap sealing and bridging devices and for suspending the anchoring members while they are secured adjacent the roadway gap, said locator assembly comprising an elongate gap spanning rail assembly defining first longitudinally spaced anchor locator means and second longitudinally spaced anchor locator means, pairs of said first and second anchor locator means being laterally spaced from each other on a line generally normal to the longitudinal line along which said first locator means lie, outriggers secured to said rail assembly and extending outwardly of each side of said rail assembly to overlie a roadway adjacent a gap for suspending said locator assembly therefrom, and wherein said rail assembly includes a laterally adjustable template means which mounts said second anchor locator means for adjusting the lateral distance between said pairs of first and second anchor locator means, temperature gauging means for identifying a plurality of different ambient temperature conditions thereby to identify a plurality of different positions of lateral adjustment, and means for securing said template means and said rail assembly against lateral movement in each of said identified positions of lateral adjustment.

3,918,166

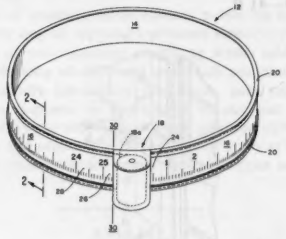
HEAD CIRCUMFERENCE MEASURING DEVICE

Peter Mason, c/o The International Grenfell Association, St. Anthony, Newfoundland, Canada

Filed Dec. 10, 1973, Ser. No. 423,156

Int. Cl.[2] G01B *3/10*

U.S. Cl. 33—179 **2 Claims**



1. A device for measuring the circumference of a head comprising, in combination,

a closed-looped rubber belt which bears inwardly against said head with sufficient force to crush hair on the head against the scalp,

a cloth measuring tape encircling said belt having a length of approximately 40 centimeters, said tape having a first end fixed relative to said belt, a second end held at a substantially constant tension, and measuring marks on its outer surface,

a storage reel mounted in a fixed relationship relative to said first tape end, said reel having

A. roller means for winding said tape, said roller means holding said second end and an adjacent portion of said tape, and

B. retractor means urging said roller means at a substantially constant tension to wind said tape so that a portion of said tape is wound onto said roller means as said belt contracts, and a portion of said tape is unwound from said roller means as said belt expands, and

a pair of embossed rubber ribs circling the outward facing edges of said belt, each rib having a transverse mutually facing groove which engages the edges of said tape.

2. A device for measuring the circumference of a head comprising, in combination,

a closed-looped rubber belt which bears inwardly against said head with sufficient force to crush hair on the head against the scalp,

a cloth measuring tape encircling said belt having a length of approximately **40** centimeters, said tape having a first end fixed relative to said belt, a second end held at a substantially constant tension, and measuring marks on its outer surface,

a storage reel mounted in fixed relationship relative to said first tape end, said reel having

A. roller means for winding said tape, said roller means holding said second end and an adjacent portion of said tape, and

B. retractor means urging said roller means at a substantially constant tension to wind said tape so that a portion of said tape is wound onto said roller means as said

belt contracts, and a portion of said tape is unwound from said roller means as said belt expands, and

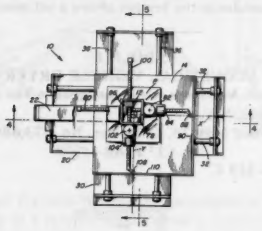
an elastic strip substantially surrounding said tape and bonded to said rubber belt at their common edges.

3,918,167

APPARATUS FOR SENSING RELATIVE MOVEMENT OF A WORK TABLE AND TOOL

Heinz Joseph Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Mar. 1, 1974, Ser. No. 447,350
Int. Cl.² B27G *23/00*; G01B *5/00*
U.S. Cl. 33—185 R **6 Claims**



1. In combination in a tool system having a tool head and a work table mounted on a supporting frame for movement of the table and head relative to one another, the tool head having a tool axis extending perpendicular to a work surface of the work table, the improvement comprising:

a first graduated scale extending adjacent and parallel to the work surface and through a first reference station on the tool head and to second reference station at the edge of the table, the scale also being aligned with a first coordinate direction defined by a coordinate axis intersecting the tool axis;

a bearing mounted on the tool head at the first reference station and supporting the graduated scale of movement relative to the head in the first coordinate direction;

a first encoder mounted adjacent the scale at the first reference station on the tool head and cooperating with the graduations of the scale for detecting relative movement of the scale and encoder; and

means connected to the edge of the work table at the second reference station for moving the scale and the encoder relative to one another in accordance with the relative motions of the table and tool in the first coordinate direction, and said means for moving the scale includes a reference member attached to said edge of the work table and having an optically flat surface contacted by one end of said first graduated scale, the flat surface being perpendicular to and intersected by said first coordinate axis at said second reference station.

3,918,168

METHOD FOR DRYING ADHERENT PARTICULATE MATTER SUCH AS A POLYVINYL CHLORIDE RESIN

Walter C. Saeman, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

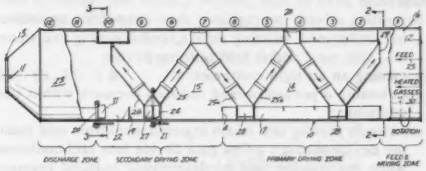
Filed Oct. 4, 1974, Ser. No. 512,148
Int. Cl.² F26B *7/00*
U.S. Cl. 34—11 **9 Claims**

1. A method for drying cohesive particulate materials in an elongated substantially cylindrical drum which is rotatable about a substantially horizontal axis, which has a feed end and a discharge end through which heated drying gases are fed cocurrently with said particulate from said feed end to said discharge end, wherein the method comprises:

a. feeding wet cohesive particulate and sufficient at least partially dried recycle particulate to a feed and mixing zone at the feed end of said drum and mixing to provide a substantially non-adherent and relatively free-flowing feed,

b. advancing said feed to the bed of a primary drying zone provided with a plurality of circumferentially spaced flights,

c. lifting a portion of said bed on said flights to an upper portion of said primary drying zone and releasing said portion to freefall into said bed through a stream of heated gases,



d. entraining a portion of said particulate in said stream of heated gases and depositing entrained particulate in the bed of a flight-free secondary drying zone adjacent said primary drying zone,

e. maintaining the bed of said secondary drying zone in rolling motion and keeping the surface of said bed in contact with said stream of drying gases to permit diffusion drying to occur and provide at least partially dried particulate,

f. recycling a portion of said at least partially dried particulate from the bed of said secondary drying zone to said feed and mixing zone,

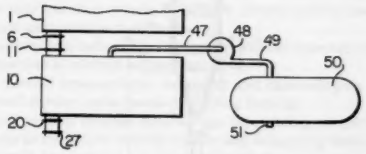
g. removing dried particulate through the discharge end of said dryer.

3,918,169

METHOD FOR DRYING AND COOLING MEAL AND APPARATUS FOR THE WORKING THEREOF

Jean Albert De Smet, Wilrijk, Belgium, assignor to Extraction de Smet, Edegem, Belgium

Filed May 14, 1974, Ser. No. 469,882
Claims priority, application Belgium, May 15, 1973, 799459
Int. Cl.² F26B *5/04*
U.S. Cl. 34—15 **4 Claims**



1. An installation for the treatment of meal cakes discharged from a solvent-operated extractor, said installation comprising:

an air tight container having a suction opening therein;

suction means connected to said suction opening by a duct for maintaining a predetermined reduced pressure in said container;

a condenser connected to said suction means and having a discharge outlet;

meal toasting means connectable to an extractor for toasting meal cakes received therefrom, said toasting means having a discharge;

first gate means connecting said toasting means discharge with said container for supplying moist meal from said extractor to said container while maintaining said predetermined reduced pressure in said container;

a shaft rotatably mounted to extend vertically through said container, said shaft having attached thereto scraper means for regularly distributing said meal in said container, said meal being cooled and dried in said container; said container having therein a discharge outlet; and

second gate means connected to said container discharge outlet for discharging cooled and dried meal from said container to said container discharge outlet while maintaining said predetermined reduced pressure in said container.

3. A method for treating solvent-impregnated meal cakes discharged from a solvent-operated extractor, said method comprising:

depositing solvent-impregnated meal cakes from an extractor into a meal toasting device, and injecting live steam into said meal within said toasting device;

providing an air tight container;

maintaining a predetermined reduced pressure within said container;

selectively passing said steam injected meal from said toasting device through a first gate device into said container while maintaining said predetermined reduced pressure in said container;

operating a scraper device within said container to regularly distribute said meal within said container, while maintaining said predetermined reduced pressure in said container and drying and cooling said meal in said container; and

selectively passing the thus dried and cooled meal from said container through a second gate device while maintaining said predetermined pressure in said container.

3,918,170

DISCHARGE MEANS IN A CENTRIFUGAL DRIER

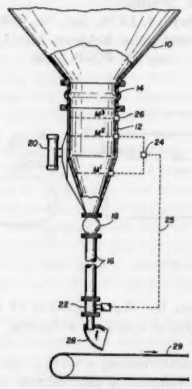
Andre' Mercier, La Madelaine, France, assignor to Fives-Cail Babcock, Paris, France

Filed Sept. 27, 1974, Ser. No. 509,914

Claims priority, application France, Sept. 27, 1973, 73.34614

Int. Cl.[2] F26B *17/24*

U.S. Cl. 34—58 **4 Claims**



1. In a centrifugal drier for the continuous production of dried solid particles, which comprises a fluid-tight, closed casing arranged to receive the dried particles and filled with a gaseous fluid under a pressure exceeding that of the ambient air outside the casing, the casing having an outlet for removing the dried particles therefrom: a discharge means fluid-tightly connected to the outlet, the discharge means including

1. a vibratory hopper fluid-tightly connected at one end thereof to the outlet of the casing,

2. a vertical discharge conduit fluid-tightly connected to the opposite end of the vibratory hopper,

a. the discharge conduit holding a column of the removed dried particles and

b. the length of the discharge conduit being such that any escape of the gaseous fluid passing from the casing through the column of removed dried particles is minor,

3. a valve between the opposite end of the hopper and the discharge conduit for controlling the flow of particles from the hopper into the discharge conduit,

4. a control valve at the lower end of the discharge conduit for controlling the output of dried particles from the discharge conduit, and

5. means for regulating the control valve so that the output of the particles from the conduit maintains the level of the dried particles in the hopper above a set miniumum level.

3,918,171

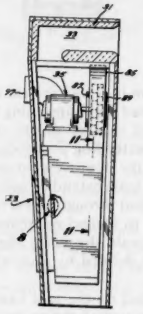
ACOUSTICAL VEHICLE DRYER

Donald A. Hull, Van Nuys, Calif., assignor to The Allen Group, Inc., Melville, N.Y.

Filed May 28, 1974, Ser. No. 473,686

Int. Cl.[2] F26B *19/00*

U.S. Cl. 34—243 C **9 Claims**



1. An acoustical vehicle drying apparatus comprising:

a frame disposed on a vehicle path;

a pair of vertically elongated side nozzles disposed on either side of said path;

a pair of housings formed with respective transition chambers leading from respective small cross section inlets and expanding to outlets leading to relatively large volume plenum chambers connected with said respective nozzles;

a pair of intake silencers connected with said respective inlets and each including a housing formed with an intake passage terminating at one end in an inlet opening and including at least one divider wall projecting inwardly from said inlet to define a turn back passage projecting along opposite sides thereof;

sound repressive means lining said intake passages and opposite sides of said divider walls;

producer means interposed between said respective intake silencers and plenum chambers; and

a plurality of coextensive directional vanes in said transition chambers commencing in respective first ends disposed in said inlets and then projecting vertically and curving gradually inwardly towards said respective nozzles while curving to diverge apart to cooperate together in forming diverging air passages and terminating in second ends spaced apart relatively large distances and substantially confronting said nozzles whereby said producer means may be energized to draw air in through said respective intake passages and to then compress said air and blow it vertically into said diverging air passages where it will be

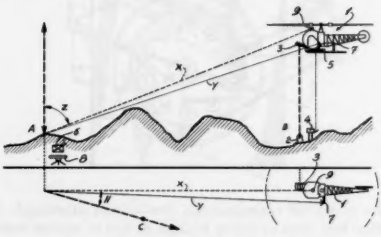
turned gradually inwardly and be expanded to exit said nozzles to dry a vehicle passing thereby.

3,918,172

METHOD AND APPARATUS FOR DETERMINING GEODESIC MEASUREMENTS BY HELICOPTER

Richard Moreau, Laval, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Dec. 26, 1973, Ser. No. 428,043
Int. Cl.² G01C *3/08*; G01B *11/26*; G02B *5/08*
U.S. Cl. 356—4 **15 Claims**



1. A system for determining the geographical position of a point located at a remote station from a reference point at a base station, comprising

a helicopter at said remote station;

a light source capable of producing a beam of monochromatic rays, said beam being vertically directed towards the helicopter;

a transparent plate having angularly disposed on one surface thereof a plurality of parallel reflecting means, said plate being mounted at the front end of the helicopter so as to permit the helicopter pilot to directly visualize said light beam striking the transparent plate and being then reflected by the parallel reflecting means towards the pilot, thereby indicating that the helicopter is substantially vertically positioned over said remote point;

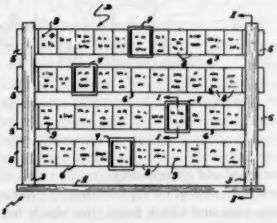
instrument means at the base station and on the helicopter for taking angle and distance measurements.

3,918,173

TEACHING AID

Jean Logos, 2616 Renan, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,280
Claims priority, application Switzerland, Mar. 27, 1973, 4433/73
Int. Cl.² G09B *1/16*
U.S. Cl. 35—9 R **8 Claims**



1. A teaching aid comprising:

a. at least two groups of items of information respectively distributed over a plural number of stationary information supports, the items of information within each of said groups of information being independent of each other with no connection between them whilst each of the items of information within one of said groups of information corresponds to the same subject as one of the items of information within the other group of information; and,

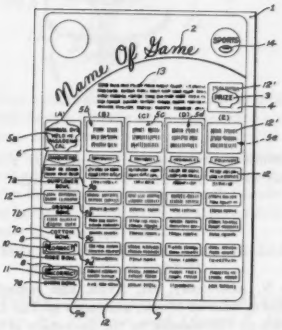
b. a checking sign for indicating each item of information, said checking signs disposed on a face of said information supports which is opposite the face on which the items of information are placed, and the checking signs indicating the items of information corresponding to the same subject being identical.

3,918,174

GAME DEVICE

Nan C. Miller, and Susie J. Murset, both of 1444 W. Cullom, Chicago, Ill. 60613

Filed Feb. 21, 1974, Ser. No. 444,327
Int. Cl.² G09B *3/08*
U.S. Cl. 35—9 R **10 Claims**



1. A game card device for participating in a game of skill which comprises:

a. a supporting sheet having disposed thereon;

b. a first indicia identifying a question;

c. a first opaque layer overlying and camouflaging said question-identifying indicia;

d. said first opaque camouflaging layer overlying said question-identifying indicia being adapted to selectively render readily visible said question-identifying indicia;

e. second indicia identifying a plurality of possible answers to said question which includes a correct answer and at least one incorrect answer;

f. third indicia indicating whether the answer selected to the question is correct or incorrect;

g. a second opaque layer overlying and camouflaging said third answer correctness-indicating indicia;

h. said second opaque camouflage layer being adapted to selectively render readily visible said indicating indicia to permit immediate ascertainment of the correctness or incorrectness of said answer;

i. a fourth indicia overlying at least one of said opaque camouflaging layers adapted to indicate conditions of integrity thereof.

3,918,175

DRIVER TRAINING SIGNALING DEVICE

Joe Heaton, 120 W. Washington St., Tipton, Ind. 46072

Filed Oct. 3, 1974, Ser. No. 511,818
Int. Cl.² G09B *9/04*
U.S. Cl. 35—11 **11 Claims**

1. A driver training signaling device comprising:

A. a base including a vertically extending support member;

B. a hood member resiliently suspended with respect to said support member and superposed with respect to said base;

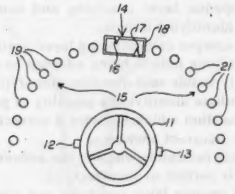
C. a signal transmitter supported upon said base and including switch elements contactible with said hood, so as to

transmit as said hood is moved as by a vehicle with respect to said base and switch elements.

3,918,176
VISUAL DIVIDED ATTENTION ALCOHOL SAFETY INTERLOCK SYSTEM

Charles N. Abernethy, III, Lynn, and Americo A. Iannini, Marlboro, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,166
Int. Cl.² G09B *19/00*
U.S. Cl. 35—22 R **10 Claims**

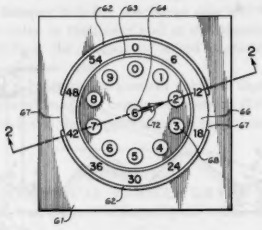


1. A divided attention intoxication testing apparatus comprising:
- first pursuit tracking display means for providing a first randomly varying display visible to a person being tested;
- first actuator means selectively operable by the person to produce first selected responses;
- first comparison means for comparing said first varying display with said first responses;
- second peripheral visual field display means for providing a second randomly varying display visible to the person viewing said first display;
- second actuator means different from said first actuator means and selectively operable by the person to produce second responses;
- second comparison means different from said first comparison means for comparing said second display with said second responses; and
- evaluation means for evaluating the comparisons made by said first and second comparison means.

3,918,177
ARITHMETIC FACT TEACHING DEVICE

Ruth E. Capshew, 915 Maxwell Lane, Bloomington, Ind. 47401

Filed June 18, 1974, Ser. No. 480,538
Int. Cl.² G09B *19/02*
U.S. Cl. 35—31 R **10 Claims**

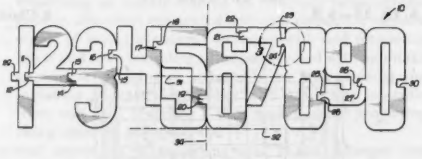


1. An arithmetic fact teaching device comprising:
- a base member having a circular track thereon;
- a first ring means removably secured in said track and having thereon a plurality of numbers arranged in circularly spaced relationship;
- a plurality of apertures in said base, said apertures being circularly spaced inside said track and radially aligned with the numbers in said track;
- a central aperture in said base at the center of the circle of said track;
- a plurality of plug means received in said plurality of apertures and in said central aperture, each of said plurality of plug means having a number thereon;
- and a movable cover on at least one of said plurality of plug means to hide the number thereon.

3,918,178
EDUCATIONAL PUZZLE

Colleen Riley, 30 Woodland Ave., Arcadia, Calif. 91006

Filed Sept. 9, 1974, Ser. No. 504,542
Int. Cl.² G09B *1/36*
U.S. Cl. 35—31 G **10 Claims**

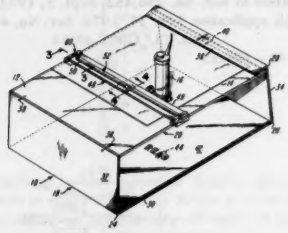


1. An educational aid comprising
- a. an ordered succession of alphanumeric characters each in three dimensional block form, the block forms having character outlines,
- b. each of the block form characters having a single tongue and groove interconnection within the height of a character, and
- c. said interconnections being staggered relative to a line extending lengthwise through said succession of characters.

3,918,179
REFLEX VIEWER AND TRACKING AID

Hans A. Mauch, and Glendon Smith, both of Dayton, Ohio, assignors to The United States Government as represented by the Veterans Administration, Washington, D.C.

Filed June 3, 1974, Ser. No. 475,580
Int. Cl.² G09B 21/00; G06K 9/04
U.S. Cl. 35—35 A 17 Claims



1. Apparatus particularly advantageous for use in teaching a blind person to use an optical probe to scan and read print or the like comprising a support for a printed page including generally vertically orienting end walls bridged by a member which is transparent, at least in part, said member providing a surface for mounting a printed page, and means providing a mirror-like surface in underlying vertically spaced relation to the said transparent part of said member adapted to mirror print on the page, as observed from the rear thereof, as the print is scanned by the optical probe.

3,918,180
PUPPET BOOK STRUCTURE

Robert W. Chamberlin, 3051 N.E. 92nd, Seattle, Wash. 98115

Filed Oct. 11, 1973, Ser. No. 405,265
Int. Cl.² G09B 17/00
U.S. Cl. 35—35 E 11 Claims

1. A book structure comprising:

a plurality of pages bound together along one edge and a cover for said plurality of pages;

an aperture in each of said pages and in said cover, said page apertures positioned at substantially the same location on each page and said cover aperture aligned with said page apertures to define a three dimensional void;

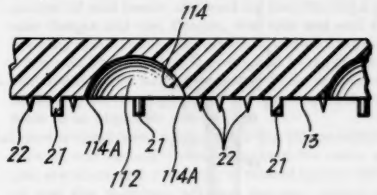
puppet means mounted on said cover adjacent said aperture therein and extendible inwardly through said page apertures, said puppet means being sized to pass through the aperture in each of said pages as said pages are turned; and

manipulation means extending through said cover and page apertures and providing animative manipulation of said puppet means with respect to the pages of said book with such manipulation being applied from the outside face of said book cover while the book is open to any selected page.

3,918,181
SPORT SHOE

Masanobu Inohara, Akashi, Japan, assignor to Onitsuka Co., Ltd., Kobe, Japan

Division of Ser. No. 383,800, July 30, 1973, Pat. No. 3,849,915. This application July 24, 1974, Ser. No. 491,263
Claims priority, application Japan, Mar. 1, 1973, 48-24971; Mar. 26, 1973, 48-12519; Mar. 8, 1973, 48-18261
Int. Cl.² A43B 5/00
U.S. Cl. 36—2.5 A 5 Claims



1. A sport shoe comprising a sole and an upper mounted on the sole, the sole having a lower surface provided with a plurality of recesses each having a rounded inner wall surface, and a plurality of first and second projections extending downwardly from non-recessed portions of the lower surface of the sole, each of the first projections having a flat lower surface and each of the second projections being tapered downwardly and being shorter than the first projections.

3,918,182
SHOE REINFORCING METHOD AND MATERIAL

Henry E. Cooper, III, Waltham, and Edward E. Gendreau, Dracut, both of Mass., assignors to The Terrell Corporation, Wilmington, Mass.

Continuation of Ser. No. 236,220, March 20, 1972, which is a continuation-in-part of Ser. No. 42,554, June 1, 1970, abandoned. This application Dec. 11, 1973, Ser. No. 423,714
Int. Cl.² A43B 13/42
U.S. Cl. 36—68 12 Claims

1. A shoe portion including an upper which has as a stiffening element a thermoplastic resinous sheet material having short, inert fibers randomly dispersed therein,

said element having been conformed to the shape of a foot form by the application of heat and pressure and wherein at least one free edge of which has been tapered or skived in situ by the flow of said resin during said application of heat and pressure, said stiffening element consisting essentially of a thermoplastic resin having a melt flow rate of at least 1 gram in 10 minutes at 100°C. and 250 p.s.i. as defined in ASTM D 1238-62 T, intimately admixed with from 5 to 30 percent by weight of the total composition of randomly dispersed short inert fibers.

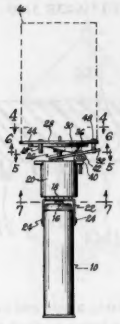
3,918,183
ROTATING DISPLAY CONSTRUCTIONS

George Poulos, 3020 Pearl St., Franklin Park, Ill.

Filed Sept. 14, 1973, Ser. No. 397,449
Int. Cl.² G09f 11/10
U.S. Cl. 40—33 14 Claims

1. In a construction for supporting an intermittently moving display comprising a motor, a display support, and means connecting the motor to the support for imparting movement to the support, said motor including a continuously rotating drive member, the improvement wherein said means for connecting said motor to said support comprise at least two first stop members carried by said support and fixed in position relative thereto, at least one second stop member, means mounting the second stop member adjacent said support, said second stop member being mounted so that it is fixed against

movement in the direction of movement of the display support and so that it is free for pivoting movement in a direction perpendicular to the direction of movement of the display support, means carried by the support for pivoting the second stop member back and forth between one position in the path of movement of the first stop members to hold the support against movement, and a second position out of said path of



movement to permit passage of the first stop members past the second stop member and to thereby result in periodic movement of the support, said means for moving the second stop member comprising a cam located for engaging said second stop member to drive said second stop member from said one position to said second position each time the cam engages the second stop member.

3,918,184

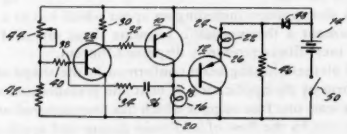
MINI-ELECTRONIC BLINKING COMPARTMENT

Albert L. Chao, 407 Glendale Road, Flushing, N.Y. 07647

Filed July 11, 1974, Ser. No. 487,792

Int. Cl.² G09F *13/00*

U.S. Cl. 40—52 R **10 Claims**



1. An alternating blinking display device having a housing means and a message area thereon comprising: a voltage source, first and second indicator means, and main operating circuit means including; first and second switching transistors of the same type, said first indicator means serially coupled to the collector of said first switching transistor forming a first series circuit branch, said second indicator means serially connected to the emitter of said second switching transistor forming a second series circuit branch, said first and second series circuit branches each connected directly across said voltage source, the base of said second switching transistor coupled to the collector of said first switching transistor, a control transistor of a type complementary to said switching transistors also connected in parallel circuit arrangement across said voltage source, the collector of said control transistor coupled to the base of said first switching transistor, potentiometer means independent of said first and second switching transistors, interconnecting the base of said control transistor with said voltage source for biasing said control transistors, and a regenerative feedback circuit including in series circuit arrangement, resistor means and capacitor means, said feedback circuit coupled between the base of said control transistor and the collector of said first switching transistor whereby said indicator means are alternatingly operative.

3,918,185

ANIMATED DISPLAY

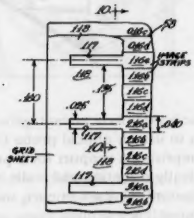
Ernest Hasala, 608 W. Hillsdale Blvd., San Mateo, Calif. 94403

Continuation of Ser. No. 286,452, Sept. 5, 1972, abandoned.

This application Feb. 19, 1974, Ser. No. 443,447

Int. Cl.² G09F *19/14*

U.S. Cl. 40—106.53 **11 Claims**



1. In an illuminated display device having illuminating means for projecting generally uniformly diffused light toward a viewer, means between said illuminating means and a viewer providing an animated display, said means comprising, in combination:

a strip image transparency sheet which has a plurality of image strips of identical width having parallel longitudinal center lines and effectively abutting edges, said strips being arranged in successive sets that consist of at least two image strips, the first image strips in all the sets collectively forming a first visual image and the second image strips in all the sets collectively forming a second visual image, and each image strip having image forming components occupying the entire space between its edges;

a grid sheet closely adjacent and parallel to said strip image transparency sheet, said grid sheet consisting wholly of parallel alternate opaque strips of equal width and transparent strips of equal width, the longitudinal center lines of successive transparent strips being the same distance apart as are the longitudinal center lines of the first image strips of successive sets, and the width of said transparent strips being materially less than the width of the image strips by a ratio of not less than about 5 to 8, so that when the longitudinal center lines of any one set of image strips are aligned with the longitudinal center lines of the transparent grid strips the image forming components along the side portions of the one set of image strips, and also the entirety of each other set of image strips, are concealed from view by the opaque strips of the grid sheet; and means permitting the first image strips and the second image strips to be viewed successively through the transparent grid strips, the materially greater width of the image strips as compared to that of the transparent grid strips causing each visual image to appear to the viewer to remain in view for a discrete time span and then dissolve into the next visual image as a result of continuous relative motion between any two of the viewer, the transparency sheet, and the grid sheet.

3,918,186
WHEEL MOUNTED DISPLAY DEVICE

Frank H. Gray, 3007 N. 47th Terrace, Kansas City, Kans. 66104

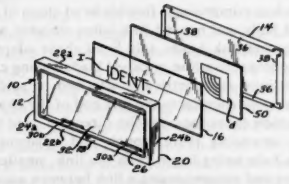
Filed May 28, 1974, Ser. No. 473,881
Int. Cl.² G09F 21/04
U.S. Cl. 40—129 B 3 Claims

1. An improved wheel-mounted display device for a wheeled vehicle in which the display device is capable of being universally mounted on substantially all types of automotive hubcaps or the like, said device comprising:
- a panel of substantially rigid sheet material having a surface bearing an advertising design or the like thereon; and
- mounting means carried by a wheel assembly of the vehicle for receiving and supporting said panel in a normally upright plane with said surface in an outwardly facing disposition relative to the wheel,
- said mounting means comprising:
  - a generally frustoconical, hollow body having a truncated, closed end,
  - said body having an internal configuration suited to permit concentric seating thereof on the outer face of a hubcap;
  - a laterally, outwardly projecting fastener concentrically located on said body at said closed end;
  - adhesive means for securing said body on the outer face of the hubcap concentrically therewith and with the wheel assembly when the hubcap is attached thereto such that said fastener rotates about an axis common with the axis of rotation of the wheel assembly; and
  - an aperture in said panel for loosely receiving said fastener,
- said panel being freely rotatable on said fastener,
- said panel having a center of gravity located below said common axis of rotation whereby said panel is maintained in a nonrotating condition when the wheel assembly ia caused to rotate.

3,918,187
SIGN ASSEMBLY

Robert E. Vogele, Western Springs, Ill., assignor to Environmental Graphic Systems, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 451,182, March 14, 1974, abandoned. This application July 19, 1974, Ser. No. 490,070
Int. Cl.² G09F 01/12
U.S. Cl. 40—156 6 Claims

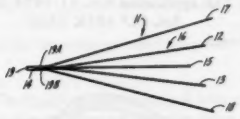


1. A sign assembly comprising:
- a frame having a front surface, a rear surface, a pair of spaced side members and a pair of spaced end members connecting said side members, said side and end members defining an opening extending through the frame, at least one of said side members being made of a flexible material;
- a transparent viewing member received in the frame adjacent said front surface, said viewing member covering the frame opening and being unattached to said one side member in at least the central portion of the side member, said viewing member having a flange extending around its periphery and being located adjacent inner surfaces of the other side member and end members;
- a backing plate removably received in and covering a rear portion of said frame, said backing plate having a pair of side flanges and end flanges, said side and end flanges abutting against the inner surface of said viewing member when said backing plate is positioned in the frame;
- a pair of elongated slats disposed on a rear surface of said backing plate having means for securing said backing plate to an object for display; and
- tab means comprising a tab on the one side member adjacent its rear surface extending toward the other of said side members, and a plurality of spaced tabs on the other of said side members adjacent the rear surface of the frame extending toward the one side member, said one side member being flexed away from the viewing member to permit passage of the backing plate beneath said one side member for removing and inserting the backing plate, said tab means retaining the backing plate in the frame when the one side member is released.

3,918,188
LAMINATING POUCH AND INTEGRATED CARRIER

Herbert M. Drower, Wilmette, and Robin Korinek, Barrington, both of Ill., assignors to Transilwrap Company, Inc., Chicago, Ill.

Filed Mar. 14, 1974, Ser. No. 450,979
Int. Cl.² G09F 1/10
U.S. Cl. 40—158 R 8 Claims



1. A laminating pouch for use in uniting a protective film with a data card or like core insert of predetermined size and configuration, comprising:
- two sheets of protective film material, each substantially larger than the core insert to be protected, joined together along one edge to form a pouch,
- the two protective film sheets each being precision cut to form a center panel surrounded by a rim and connected to the rim by a plurality of frangible bridges, the two center panels being in accurate registry with each other and each corresponding precisely in size and configuration to the core insert.

3,918,189
INDEXING SYSTEM FOR REVOLVERS

Thomas J. Hartog, Gunnison, Utah, assignor to Browning Arms Company, Morgan, Utah

Filed Apr. 26, 1974, Ser. No. 464,573
Int. Cl.² F41C 1/00
U.S. Cl. 42—67 3 Claims

1. In a revolver including means for spinning a cylinder mounted within a frame in response to pulling a trigger to

bring individual chambers of the cylinder sequentially into registration with a bore of a barrel attached to said frame, the improvement which comprises:

a series of indexing grooves arranged in a ring around the outer surface of the cylinder, one such groove corresponding to each chamber of the cylinder and each of said grooves comprising a shallow ramp portion at the leading end of the groove and a well portion at the trailing end of the groove terminating in a check surface;

stop means normally biased to register with the well portion of the groove corresponding with a chamber in registration with the bore of the barrel including a projection with a ramped distal surface to permit partial entry of said projection into said well as the cylinder is advanced towards its registered position; and

linkage means cooperative with said stop means and said trigger to retract said stop means from said well portion in response to pulling of said trigger to permit said cylinder to rotate and thereafter to release said stop means to engage the ramp portion of the next succeeding groove before the corresponding chamber is urged into registration with said bore.

3,918,190

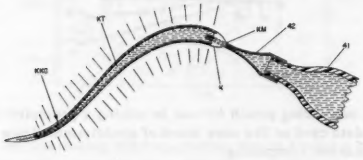
METHOD FOR ILLUMINATING ORGANIC FISHING BAITS

Eugene K. Hornbeck, 2709 Anderson Drive, Lincoln, Nebr. 68506

Continuation-in-part of Ser. No. 464,812, April 29, 1974, abandoned. This application Nov. 11, 1974, Ser. No. 522,597

Int. Cl.² A01K *85/00*

U.S. Cl. 43—4.5 **4 Claims**



1. The method for illuminating transluscent fishing bait having an internal tract so as to enhance the attraction of said illuminated bait for game fish, said method comprising the following steps in order:

A. Initiatably desegregating normally stable interreactive chemical components including a first-component and a second-component to allow said chemical components to inter-react thereby initiating a liquid chemiluminescent light source having a long-term extended continuous time-duration;

B. Penetrating a needle-like tubular snout tool deeply into the bait internal tract;

C. Injecting the liquid inter-reacting chemiluminescent light source into the internal tract of a transluscent bait through said penetrated tubular snout;

D. Incorporating the internally illuminated transluscent bait into the leadward portion of a fishingline as a tackle portion therefor; and

E. Casting the leadward fishingline including the said chemiluminescent treated bait from a fisherman's casting-station to an aquatic medium remote therefrom.

3,918,191

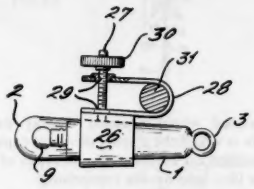
NIGHT-TIME FISHING ALARM

John J. Williamson, 44 Signal Hill Blvd., Belleville, Ill. 62223

Division of Ser. No. 366,415, June 4, 1973, abandoned. This application July 29, 1974, Ser. No. 492,426

Int. Cl.² A01K *97/12*

U.S. Cl. 43—17 **5 Claims**



1. Signal means including a device having a normally deenergized electrically actuated light source, means for securing said device directly to a flexible pole, means responsive solely to flexure of said pole for energizing said light source whereby during flexure of said pole said light will flash, said securing means being constructed to permit variation of the angularity of said device with respect to said pole and comprising an annular bracket for receiving said device, a threaded stud secured to said bracket and extending radially therefrom, a U-shaped clamp rotatably mounted on said stud via two clearance holes in its extremities, and a nut on said stud outwardly of the outer extremity of said clamp, said pole passing through said U-shaped clamp.

3,918,192

JIG-SPINNER FISH LURE

Phillip A. Rabideau, 201 Penhurst Drive, Pittsburgh, Pa. 15235

Continuation of Ser. No. 280,442, Aug. 14, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,767

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.17 **12 Claims**

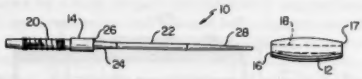
11. A fish lure comprising a flexible bead chain of a plurality of hollowed balls and headed link wires wherein a hollowed ball encompasses link heads, said bead chain adapted at one end for attachment to a line, a dished blade having convex and concave portions asymmetrically attached to said chain so that the convex portion faces the line end of the chain and the concave portion faces the opposite direction, said blade having a hole extending therethrough and adjacent one end thereof, the hole being larger than the link, smaller than the ball diameter and encompassing a link between adjacent balls to provide the asymmetric attachement and providing rotation when drawn through water, an assembly attached to another end of the chain comprising a weighted body member and a hook member.

3,918,193

FISHING FLOAT AND METHOD OF ASSEMBLY

Vernon J. Schneider, Licking Pike, Sun Valley, Alexandria, Ky. 41001

Filed July 25, 1974, Ser. No. 491,741
Int. Cl.² A01K 93/00
U.S. Cl. 43—43.1 5 Claims



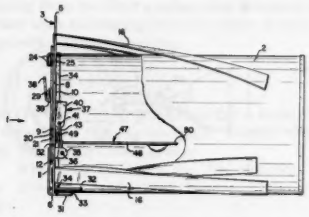
1. A fishing float comprising a float member having a bore extending therethrough and being formed with positioning faces at each end of said bore, said faces being transverse to the axis of said bore, said bore being of uniform diameter; a stem insertable through said float bore and being formed with a shoulder transverse to the axis of said stem, said shoulder and one positioning face being in abutting relationship one to the other to precisely position said float member relative to said stem, an intermediate portion on said stem having an outer diameter slightly less than the internal diameter of said float member bore, and an outwardly flaring tapered portion extending from one end of said intermediate portion to said stem shoulder, the diameter of the tapered portion at the shoulder end being slightly larger than the float member bore wherein a press fit exists between said float member and said stem when said float member is positioned against said shoulder; securing means for securing said float member to said stem; and line securing means on said stem for attaching the fishing float to a fishing line.

3,918,194

TRAP CLOSURE

George F. Waske, Worth, Mo. 64499

Filed Nov. 29, 1974, Ser. No. 528,281
Int. Cl.² A01M 23/20
U.S. Cl. 43—61 10 Claims



1. A trap closure for use in combination with a hollow container having a rim defining an entrance opening thereinto comprising:

a. a plate having a front face and a back face and an access opening therethrough, said plate being adapted to be secured over said entrance opening with said back face directed into said container and said access opening communicating with said entrance opening;

b. first and second overlapping door members adjacent said front face and respectively having one end adapted to block said access opening and an other end, an anchoring device associated with each of said other ends;

c. said door members respectively being pivotally mounted on said plate at spaced pivot points located generally centrally between said door member ends and positioned on said plate spaced from said access opening and from each other, whereby said door member one ends overlap said access opening when said door member other ends are displaced toward each other;

d. a resilient tensile member connected to said door member anchoring devices and urging said door member other ends toward each other;

e. trigger latch means mounted on said plate and located adjacent said back face and normally retaining said door member other ends spaced apart a distance sufficient to permit passage through said access opening, said trigger latch means being adapted to release said door members upon triggering, whereby said one ends overlap said access opening, and

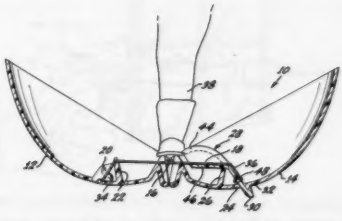
f. trap setting means movably engaging and guiding said first and second door members and operable to simultaneously rotate said first and second door members about said spaced pivot points.

3,918,195

APPARATUS FOR TRAPPING AN APPENDAGE ON A FIGURE TOY

John Terry Benson, Encino, and Peter Charles White, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 12, 1974, Ser. No. 531,945
Int. Cl.² A63H 33/00
U.S. Cl. 46—1 R 5 Claims



1. Apparatus for trapping an appendage on a figure toy, comprising:

a pair of jaws;

hinge means swingably connecting said jaws together;

biasing means for exerting an opening force on said jaws below said hinge means when said jaws are swung to fully open positions and for exerting a closing force on said jaws when said hinge means is moved below said biasing means; and

fastening means connecting said biasing means to said jaws in such a manner that said biasing means lies below said hinge means when said jaws are open and above said hinge means when said jaws are closed, whereby said jaws will be held open by said biasing means until said appendage exerts a downward force on said hinge means for moving said hinge means below said biasing means, whereupon said biasing means will pull said jaws into gripping engagement with said appendage.

3,918,196

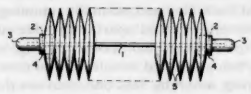
FLEXIBLE PEGS AND CONNECTORS FOR USE IN A GAME OR AMUSEMENT DEVICE

Friedrich Schleich, Am Limes 73, D-7071 Horlikofen, Germany

Filed Sept. 24, 1973, Ser. No. 400,051
Int. Cl.² A63H 33/10, 3/04
U.S. Cl. 46—29 12 Claims

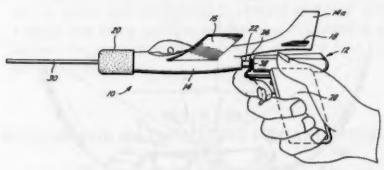
1. A peg for a game or amusement device, in which the peg comprises a flexible wire core covered by a synthetic-resin envelope, with the ends of the envelope being rigid and the central remaining section of the envelope being pliant, and in

which said pliant section of the envelope is a one-piece body with radial flanges, having a cross-section greater than said



rigid ends, and wherein said rigid ends are secured to said wire core.

3,918,197
TRIGGER-LAUNCHED JET PLANE
Victor Stanzel, Schulenburg, Tex. 78956
Continuation of Ser. No. 298,475, Oct. 18, 1972, abandoned. This application Mar. 24, 1974, Ser. No. 454,725
Int. Cl.² A63H *27/14*
U.S. Cl. 46—81 **9 Claims**



5. A toy comprising an airplane and a hand-launching apparatus therefor,

said airplane comprising a body, nose, wings and a tail section,

said nose being formed of resilient shock-absorbing material and having a longitudinally extending bore therethrough, said body including lower rear portion disposed below the juncture of said body and said tail section with said tail section being formed integrally with said body and disposed above and rearwardly of said lower rear portion of said body,

a cylindrical launching tube extending through an opening in said lower rear portion of said body and into the bore of said nose, the rear end of said launching tube terminating short of the rear end of said tail section and being located in a horizontal plane below said tail section so as to be accessible to said launching apparatus; and

latch means on said airplane for retaining said airplane on said launching apparatus;

said hand-launching apparatus for launching said toy airplane comprising,

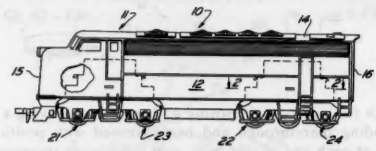
a handle,

an elongated launching rod mounted in said handle and adapted to be slidably received within the bore of said launching tube,

a launching spring disposed about said launching rod for resiliently urging said airplane in the direction of launch, retaining means on said handle including a catch for engaging said latch means on said airplane to retain said airplane on said launching rod with said spring in a compressed position, and

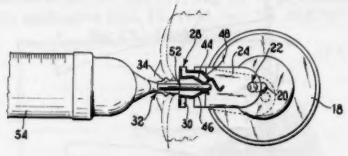
a trigger connected to said retaining means for selectively moving said catch out of engagement with said latch means to launch said airplane.

3,918,198
TOY VEHICLE
Richard C. M. Cheng; Gene Patrick Dennis, and Robert Edward Kircher, all of Woodbury Heights, N.J., assignors to Consolidated Foods Corporation, Woodbury Heights, N.J.
Filed Feb. 21, 1974, Ser. No. 444,330
Int. Cl.² A63H *19/02*
U.S. Cl. 46—206 **16 Claims**



1. In a toy vehicle, the combination comprising a unitary, block-like, upright truck housing having first and second recesses opening laterally from opposite sides of said housing, a motor in said first recess and rotatable about a laterally extending axis, a motor shaft projecting laterally through and from the opposite side of said housing from said first recess, wheeled running gear on the underside of said housing and rotatable about generally laterally extending axes, and drive means in motion transmitting relation between such shaft and said running gear for driving the latter, at least portions of said drive means and said running gear fitting in said second recess and portions of said running gear extending from a downward opening of said second recess.

3,918,199
DOLL SIMULATING NATURAL SUCKING MOTION AND CONTROL DEVICE FOR SAME
Loris De Masi, 34/A Via Brambilla, Pavia, Italy
Filed May 9, 1974, Ser. No. 468,540
Claims priority, application Italy, Jan. 10, 1974, 19262/74
Int. Cl.² A63H *33/26, 13/02*
U.S. Cl. 46—247 **4 Claims**



1. In a doll including a hollow head and a hollow chest interconnected at a hollow neck, and formed of elastically deformable material permitting relative movement of the head and chest, the head having a face part including a mouth opening portion, having a natural position somewhat recessed into the hollow head, and cheeks adjacent the mouth portion, mechanism for simulating natural sucking motions comprising, in combination, a geared electric motor means mounted within said chest adjacent said neck and having a generally vertically oriented output shaft rotatable by said motor means at a low angular velocity; a crank formed by the upper end of said output shaft within said head for rotation of said upper end in a plane perpendicular to the principal axis of the doll and substantially at the level of said mouth opening portion; connecting means secured at one end to said mouth opening portion and pivotally connected at the opposite end to said crank for reciprocation by said crank responsive to rotation of said output shaft; whereby, upon energization of said motor means, said mouth opening portion and the adjacent portions of said face part are reciprocally deformed to simulate natural sucking and said head and chest are subjected to relative

movement; said connecting means including a rigid component firmly coupled to said mouth opening portion; guiding means on said component operable to house and guide a stem-shaped control device, simulating the end of a baby's feeding bottle or the like, insertable into said mouth opening portion; means for controlling energization of said motor means, said controlling means including a first pair of normally disengaged spring contacts, mounted on said connecting means in a position wherein at least one said contact is encountered by a stem-shaped control device inserted into said mouth opening portion and brought into engagement with the other, said pair of contacts being disengaged responsive to withdrawal of the stem-shaped element from said mouth opening portion; electrically energized sound reproducing means mounted in said hollow chest; and means for controlling energization of said sound reproducing means including a second pair of contacts mounted on said connecting means and normally engaged, said second pair of contacts including one contact of said first pair; said second pair of contacts being positioned to be encountered by the stem-shaped control device upon insertion thereof into said mouth opening portion to disengage the contacts of said second pair from each other, said contacts of said second pair being reengaged responsive to withdrawal of the stem-shaped element from said mouth opening portion.

3,918,200

METHOD FOR INCREASING DIOSGENIN YIELD FROM DIOSCOREA CULTIVATION

Carlos Manero; Miguel Escobar, both of Mexico City, Mexico; Emanuel B. Hershberg, West Orange, and Hershel L. Herzog, Glen Ridge, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 9, 1974, Ser. No. 513,443

Int. Cl.² A01G *17/00*

U.S. Cl. 47—58 **4 Claims**

1. In the process of cultivating Dioscorea plants in order to produce extractable diosgenin in their roots, the improvement for increasing the yield of diosgenin which comprises cultivating said plants on an artificial support system to a height within the range of 4 to 6 meters, wherein said plants are cultivated to effect a first period of vertical growth, followed by cultivating them to effect a subsequent period of horizontal growth, and then cultivating them to effect a final period of vertical growth before harvesting.

3,918,201

AUTOMATIC CONTROL SYSTEM FOR A SLIDING DOOR

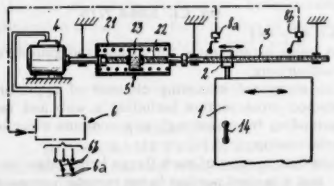
Charles Graziano, Seine-Saint-Denis, France, assignor to Falveley S.A., Saint Ouen, France

Filed July 12, 1974, Ser. No. 488,490

Claims priority, application France, July 27, 1973, 73.27558

Int. Cl.² E05F *15/14*

U.S. Cl. 49—28 **5 Claims**



1. An automatic control system for a sliding-motion door having at least one leaf rigidly fixed to a nut associated with a threaded operating rod driven in rotation by a reversible electric motor associated with an elastic coupling system which is deformable in rotation, the supply circuit of the motor being provided with a first switch and a second switch, a speed-reduction resistor which can be changed-over by means of the first switch controlled by the displacement of the door leaf, wherein the supply circuit of the motor includes a protective resistor permanently mounted in series with the motor, and a voltage limiter which can be changed-over by means of the second switch controlled by the displacement of the door leaf so as to connect the voltage limiter in shunt across the motor terminals at the end of travel of said door leaf, the values of the two resistors and the threshold values of the voltage limiter as well as the characteristics of the motor being so selected as to limit the current intensity in the motor, when said motor is at a standstill, at a sufficiently low value to maintain the normal operating voltage at the terminals of the motor supply circuit, said nut and said threaded operating rod moreover constituting a reversible-action motion converter.

3,918,202

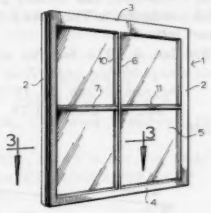
WINDOW GUARDS

Roy F. Smith, 17590 Asbury Park, Detroit, Mich. 48235

Filed June 6, 1974, Ser. No. 477,309

Int. Cl.² E06B *3/68*

U.S. Cl. 52—106 **10 Claims**



1. The combination, with a window which includes a frame and a pane carried by the frame, of a stiff bar which extends across the pane from one point to another on the frame and is attached to the frame at both points, and a strip which extends lengthwise of the bar and is located between a surface of the pane and the surface of the bar which faces the pane and is carried by the bar.

3,918,203

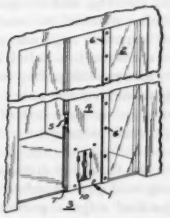
PET ACCESS PANEL

Clinton E. Ellison, Jr., 1636 N. Wells, Chicago, Ill. 60614

Filed May 23, 1974, Ser. No. 472,589

Int. Cl.² E06B *7/30*

U.S. Cl. 49—168 **5 Claims**



1. A pet access panel comprising

panel means adapted to be attached to a closure,

said panel means including pivotally mounted door means to permit unattended passage by an animal,

said door means includes two sections pivotally mounted to the panel means to substantially contact each other at

respective edges in a closed position and adapted to open in two directions by contact by an animal,

said sections each having a rigid portion and a flexible means attached thereto,

said rigid portion of each of said two sections having a substantially planar edge surface of predetermined thickness and at least one corresponding open area extending from said planar surface into said rigid portion to create an opening through said rigid portion in a closed position of the door means,

said flexible means including at least one resilient element attached to the planar surface of each of said two sections to create said respective edges,

said flexible means further including a pair of flexible coverings having a portion respectively attached to the rigid portion of each of said sections to cover said at least one opening in a closed position of the door means, and

said flexible covering further having unattached portion being bendable with respect to said rigid portions and the resilient element in response to passage through the door means by an animal.

3,918,204

GATE ASSEMBLY

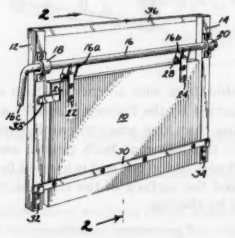
John P. Lynch, Vermillion, and Delmar J. Lynch, Burbank, both of S. Dak., assignors to Theodore J. Dolney, Vermillion, S. Dak., a part interest

Filed Jan. 4, 1974, Ser. No. 430,798

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² E05D *15/28*

U.S. Cl. 49—246 **5 Claims**



1. A gate assembly comprising:

a. a gate member having spaced longitudinal edges and spaced transverse edges;

b. a support adjacent each of said transverse edges defining an opening, said gate member having a locked position closing said opening, and an open position;

c. a crankshaft rotatably mounted on and extending between said supports adjacent one of said longitudinal edges, said crankshaft including a handle at one end, and crank arm means with a free end movable over center between gate locking and gate opening positions;

d. latch means on at least one of said gate member and supports generally adjacent the other of said longitudinal edges for latching said other longitudinal edge to said supports in the locked position of the gate member and for releasing said gate member upon movement of said one longitudinal edge a predetermined distance away from the locked position;

e. hinge means for pivotally connecting said free end of said crank arm means to said gate member adjacent said one longitudinal edge to permit positioning of said gate member in the locked position with said latch means engaded, or alternately to permit said one longitudinal edge of said gate member to be pivoted on the pivotal connection of said hinge means over center to release said latch means after a predetermined amount of morement over center; and

f. means for opposing the movement of said gate member from said over center locked position.

3,918,205

WINDOW, PARTICULARLY FOR BEING MOUNTED IN AN INCLINED ROOF

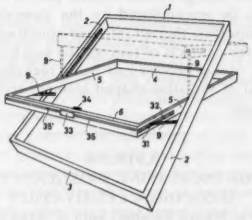
Villum Benedikt Kann Rasmussen, No. 6 Solystparken, 2930 Klampenborg, Denmark (2930)

Filed May 7, 1974, Ser. No. 467,734

Claims priority, application Denmark, May 15, 1973, 2680/73; Sept. 6, 1973, 4908/73

Int. Cl.² E05D *15/40*

U.S. Cl. 49—252 **5 Claims**



1. A window comprising:

a frame member and a sash member;

pivot means at an intermediate portion of said sash member defining an axis and permitting said sash member to be tilted relative to said frame member about said axis;

link means extending substantially perpendicularly to said axis;

means hingedly connecting the ends of said link means to said frame and sash members, respectively;

first guide means in one of said members defining a displacement path for said pivot means parallel to the plane of such member;

second guide means in one of said members defining a displacement path for the hinge means connecting said link means to such member; and

locking means to selectively prevent the displacement of said pivot means or said hinge means along said first and second guide means, respectively.

3,918,206

WINDOW GUIDE

Hans Dochnahl, Willich, Germany, assignor to Draftex GmbH, Viersen, Germany

Filed Nov. 29, 1973, Ser. No. 420,138

Claims priority, application Germany, Dec. 2, 1972, 2259041

Int. Cl.² E06B *7/16*

U.S. Cl. 49—441 **8 Claims**

1. A guide arrangement for sealing and guiding a movable pane comprising:

a. an elongated mounting channel of approximately U-shaped cross section including a web and two flanges extending from said web in a common direction spaced relationship,

1. a first portion of each flange being adjacent said web, and a second portion being remote from said web and including a free edge portion,

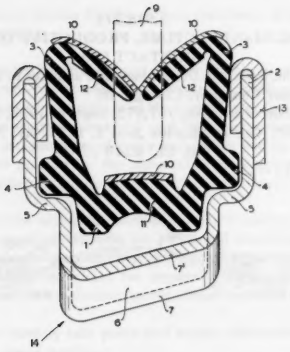
2. said web and said flanges bounding a cavity in said channel,

3. said second portions being offset from said first portions outward of said channel so as to define a shoulder one each flange in said cavity;

b. an elongated channel-shaped gasket of resilient material in said cavity,

1. said gasket having a web portion, two flange portions extending from said web portion in a common direction, and a longitudinal rib projecting from each flange portion in a direction away from the other flange portion,

2. each rib being offset from an associated one of said shoulders outwardly of said cavity for abutting engagement with the associated shoulder when said gasket moves inward of said cavity,

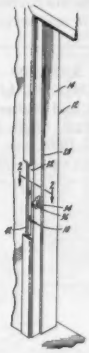


3. said web and said web portion bounding an air space therebetween when said ribs abuttingly engage the associated shoulder; and

c. abutment means projecting from each of said flanges toward the other flange and engaging one of said ribs when said gasket moves outward of said cavity and said one rib is moved thereby away from said aubtting engagement with the associated shoulder, the spacing of said shoulder and of said abutment means being greater than the dimension of said rib in the direction of movement of said gasket inward and outward of said cavity.

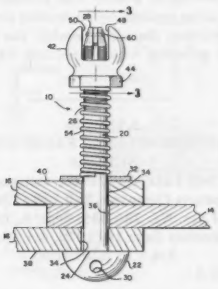
3,918,207
DOOR FRAME PROTECTOR
Paul Aliotta, 3012 N. Wastenaw Ave., Chicago, Ill. 60618
Filed May 7, 1974, Ser. No. 467,650
Int. Cl.² E06B *1/04*
U.S. Cl. 49—462 **7 Claims**

1. In a door frame comprising an upstanding side member having a generally concealed outer face and an exposed inner face, said inner face having a door-stop surface associated therewith and a bolt receiving recess formed therein between the stop surface and one edge of the side member, a door frame protector comprising a plate attached to the concealed



outer face of said member, said plate having a flange engaged with the said one edge of the side member.

3,918,208
COUPLING DEVICE
Willis A. Fairchild, 273 West Broadway, Shelbyville, Ind. 46176
Filed Apr. 26, 1974, Ser. No. 464,996
Int. Cl.² F16B *21/00, 39/02*
U.S. Cl. 151—5 **1 Claim**



1. A device for coupling connecting means comprising a pin having a shaft with a head at its lower end and a threaded portion adjacent its upper end, a washer slidably carried by said shaft between said head and said upper end, said shaft being adapted to fit through aligned openings in the connecting means with said head in contact with the lower face and said washer in contact with the upper face of the connecting means, a nut threadably engageable with said threaded portion of said shaft and being removable therefrom, a coil spring slidably carried by said shaft between said washer and said nut with one end of said spring abutting said washer and the other end thereof abutting said nut, and a locking pin pivotably connected with the threaded portion of said shaft adjacent to its upper end, said locking pin having a first dimension which is greater than the maximum diameter of said threaded portion and a second dimension which is less than said diameter, said locking pin being pivotally mounted substantially midway between said two dimensions, said locking pin being pivotal between a first position wherein said greater dimension is axially aligned with the axis of said shaft and a second position

wherein said greater dimension is perpendicular to said axis, said locking pin and said nut being adapted to be inter-engageable to secure said nut in desired positions, said nut having inner walls forming an open space in its upper portion to receive said locking pin therein in contact with said inner walls when said locking pin is in said second position

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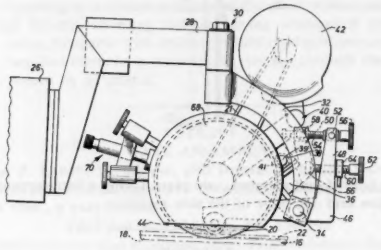
3,918,209

METAL REMOVAL APPARATUS

Stanley Crawley, Formby, and Walter Taylor, Billinge, both of England, assignors to BOC Limited, London, England

Filed Aug. 19, 1974, Ser. No. 498,608
Int. Cl.² B24B *19/02*
U.S. Cl. 51—5 D **11 Claims**



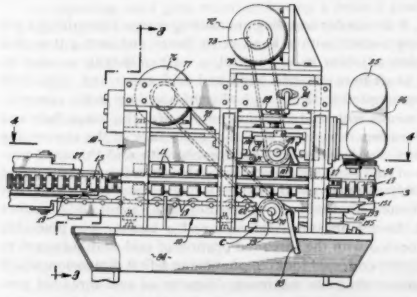
1. Metal removal apparatus, including a resinoid-bonded grinding wheel mounted on a sub-assembly also supporting a motor arranged to drive the grinding wheel at a high speed, in which the sub-assembly is mounted on a slide supported by an arm pivotally mounted on a support shaft; a riding roller mounted on one end of a lever also pivoted on the support shaft and able to be pivoted by controlled amounts relatively to the arm supporting the sub-assembly, the roller axis being parallel to the grinding wheel axis and adjustably spaced therefrom.

3,918,210

APPARATUS FOR MILLING FACES OF MASONRY BLOCKS

Takeshi Mori, Salt Lake City, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah

Continuation of Ser. No. 286,035, Sept. 5, 1972, abandoned. This application June 10, 1974, Ser. No. 477,633
Int. Cl.² B24B *9/06*
U.S. Cl. 51—80 A **30 Claims**



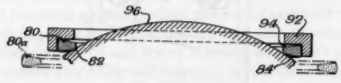
1. In apparatus for facing blocks: a supporting bed to receive the blocks with one face of the blocks resting on said supporting bed; a cutter station at the forward portion of said bed and including one or more cutters for cutting one or more faces of each block; an elongate endless drive member having adjacent drive pads thereon for engaging one side of each block other than said one face to transmit the drive force of said drive member and pads to said one side and feed the blocks forwardly along the bed and across said one or more cutters, whereby a cutting action is performed on one or more faces of each block; a stationary uninterrupted elongate guide rail disposed parallel to the direction of feed of the blocks and engaged by said drive member and along which said drive member is movable to support said drive member and pads for movement in a fixed plane while said pads are engaged with said one side of each block; support means for engaging the side of each block opposite said one side to maintain the blocks in driving engagement with said pads as said drive member and pads feed the blocks forwardly along the bed and across said one or more cutters; and means supporting said support means in another fixed plane for engagement with the opposite side of each block, whereby each block is clamped between said pads and support means.

3,918,211

RING MANUFACTURE, PRODUCTIVE OF LINE CONTACT SEAL

Norman M. Packard, Des Plaines, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 757,973, Sept. 6, 1968, Pat. No. 3,587,155. This application June 3, 1974, Ser. No. 475,539
Int. Cl.² B24B *25/00*
U.S. Cl. 51—157 **1 Claim**



1. Apparatus for lapping, on a confronting surface, an interposed split ring which is to be localizedly side lapped at only an inner periphery thereof adapted to project into contact with said confronting surface, the ring being one which, when in a collapsed state conforming to a cylinder bore size for which nominally designed, becomes closed or substantially so at the split in the ring, said ring having a relaxed state in which the split opens up to impart to the ring its larger, free-spring diameter, said apparatus comprising:

a ring fixture having an open mouth for receiving the ring, said mouth being cylinder-bore-shaped of a smaller diameter than the free-spring diameter of the ring;

a lapping surface confronting said mouth in spaced apart relation to the ring fixture;

said mouth being of a size and shape equivalent to said cylinder bore to insure retention of the received ring precisely in collapsed state at all times, for holding the ring relative to the lapping surface so that said ring side forms at all times a slight angle to said surface whereby to provide the ring side with a lapped narrow sealing band at said locally contacting inner periphery;

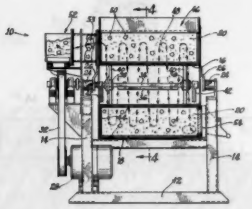
the cylinder bore-shaped open mouth of the ring fixture characterized by a ring-engaging bottom therein deep enough so that, when the ring is bottomed in the mouth, the mouth can engage and hold the ring by the latter's outer periphery in a properly radially collapsed state, and shallow enough therein that the projecting inner periphery of the ring will constitute freely and solely the protruding structure establishing the requiring lapping contact; and

means for causing relative movement between the fixture and confronting lapping surface in at least one direction of lap the confronting lapping surface being convex-spherical.

3,918,212
APPARATUS FOR FINISHING PARTS

Harvey Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Nov. 23, 1973, Ser. No. 418,556
Int. Cl.² B24B *31/06*
U.S. Cl. 51—163 **9 Claims**



1. A vibratory device for the surface treatment of parts with media comprising:

a base;

a pair of horizontally disposed concentric circular members of different radii closed by an end wall rigidly connected to said circular members at their ends to define an annular chamber therebetween, said chamber having an inlet for the introduction of parts and media and an outlet at an upper portion for the removal of parts and media;

means resiliently supporting the circular members on the base;

a shaft coaxial with said circular members having eccentric means mounted thereon for rotational movement about a horizontally disposed axis and operatively connected to said circular members for imparting vibrational movement thereto responsive to rotational movement of said shaft,

means for loading said parts and media into said chamber at said upper portion;

means for discharging said parts and media from said upper portion, said discharge means including means for returning said media to said chamber at a bottom portion thereof by vibration from said shaft and gravity,

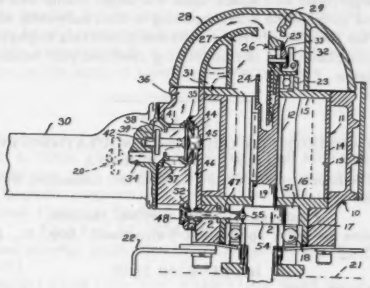
whereby parts and media located within said annular chamber are subjected to vibrational action while being caused to move circumferentially within said annular chamber.

3,918,213
OVERSPEED SAFETY CONTROL MECHANISM FOR ROTARY TOOLS

Emmet E. Stout, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,719
Int. Cl.² B24B *23/02*
U.S. Cl. 51—170 T **2 Claims**

1. In a rotary grinding tool including a grinding wheel and a pneumatically powered motor having a spindle carrying the wheel, a live air inlet chamber having an inlet connecting with a supply passage and an outlet communicating with the motor, a valve controlling air flow through the inlet, a diaphragm dividing the inlet chamber off from a pressure counterbalancing chamber, an axially extending stem operatively connecting the diaphragm with the valve, the diaphragm being responsive to inlet air pressure over a front face thereof exposed to the inlet chamber to draw the valve to a closed condition and being responsive to a counterbalancing air pressure over a rear face of the diaphragm exposed to the counterbalancing chamber to hold the valve in a normal open condition, a passage in the stem communicating the inlet chamber with the counterbalancing chamber so as to develop the counterbalancing air pressure over the rear face of the diaphragm, a relief passage connected with the counterbalancing chamber for relieving the latter of the counterbalancing pressure and as a consequence allowing the diaphragm to draw the valve to closed condition, a frangible pressure air relief plug normally sealing the relief passage against relief of the counterbalancing

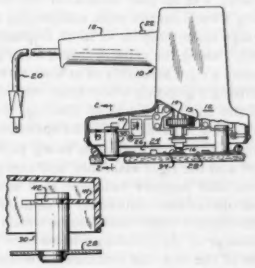


air pressure, and flyweight means carried by the spindle having response to development of a predetermined centrifugal force by the motor in the spindle to swing outwardly to engage and rupture the relief plug for release of the counterbalancing air pressure.

3,918,214
VIBRATING SANDER

Jerome Buschman, Jefferson City, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 2, 1974, Ser. No. 511,450
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 R **5 Claims**



1. In a vibrating sander having a housing and a platen and flexible posts secured therebetween movably supporting the platen, and power means carried in the housing operable to oscillate the platen relative to the housing, the improvement being the connection of the posts to the platen, comprising for each post being of resilient rubber only and the combination of the platen having a receiving opening and the post having a main portion of cross section larger than the opening and an end portion sized slightly smaller than the opening suited to be positioned completely through the opening and the end portion further having adjacent the post main portion a necked down recess portion of smallest cross section, and a split ring clamp adapted to be snapped over the post end portion and having an inwardly directed ledge which is received snuggly in the necked down post recess portion to hold the clamp relative to the post, the clamp further having an exterior nose which substantially overlies the remainder of the post end portion and tapers from a nose end which is smaller than the platen opening to the opposite end which is larger than the

platen opening but capable of being deformed smaller upon and incident to axially wedging of the tapered nose into and through the opening from the housing side of the platen whereupon the post main portion abuts the platen, and the clamp still further having a reduced diameter section terminating at a shoulder facing away from and inwardly adjacent the larger nose end suited upon the larger clamp end being wedged through the platen opening to shift outwardly whereupon the shoulder abuts the workside platen face to physically lock the clamp and the underlying confined post relative to the platen.

3,918,215

CARRIAGE FOR GRINDING UNDULATIONS IN RAILWAY TRACK RAILS

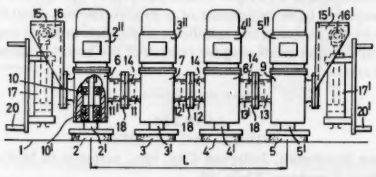
Fredy Scheuchzer, 7, Av. du Mont-d'Or, Lausanne, Switzerland

Filed Aug. 7, 1973, Ser. No. 386,456

Claims priority, application Switzerland, Aug. 31, 1972, 12832/72

Int. Cl.² B24B *23/00*

U.S. Cl. 51—178 **6 Claims**



1. A carriage for grinding undulations in railway track rails, said carriage being provided with a plurality of motorized rotary grinding wheels and means for relieving the loads of said grinding wheels on the rails, comprising a support linked to the carriage main body so as to be displaced together with the main body along the railway track; a rail grinding apparatus comprising a rigid assembly of at least three grinding units, each comprising a grinding wheel fixed on a shaft, a motor for rotation of the shaft, and a shaft bearing; a weight relieving means comprising a plurality of jacks operatively connected to said apparatus for relieving loads being positioned between said support and the rigid assembly; and complementary links mounted on said support between said assembly and said support and operatively connected to said jacks to enable the assembly to execute slight movements which are imparted to it by the passage of the grinding wheels over the crests of the undulations of the rail, the distance between the peripheries of the grinding wheels and the distance between the edges of the extreme grinding wheels are such as to prevent the penetration by any grinding wheel of a trough of the undulation over which the grinding wheel is crossing, the distance between the edges of the extreme grinding wheels being approximately equal to the amplitude of two wave lengths of the undulations in the rail, said distance between the edges of the extreme grinding wheels being controllable by core means positionable on or between the units.

3,918,216

TUBING SEVERING METHOD

Howard S. Best, Horseheads; Bruce A. Milliman, Elmira, and Edward J. Zak, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,735

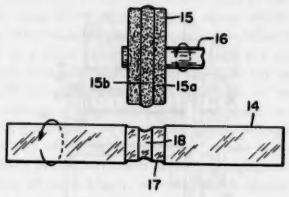
Int. Cl.² B24B *1/02*

U.S. Cl. 51—283 **4 Claims**

1. The method of severing tubing of a relatively brittle material, such method comprising the steps of;

I. rotating a length of said tubing about its longitudinal axis,

II. grinding the outer surface layer from said length of tubing in a selected annular region thereof to provide a smooth shallow annular recess therein having beveled ends,



III. terminating rotation of said length of tubing and clamping it in a stationary position, and

IV. cutting through said length of clamped tubing in the center of said annular recess to provide two lengths of tubing having beveled cut ends similar to each other.

3,918,217

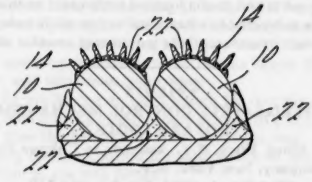
ABRADING DEVICE WITH PROTRUSIONS ON METAL BONDED ABRASIVE GRITS

Lloyd R. Oliver, Algonac, Mich., assignor to Lloyd R. Oliver & Company, St. Clair, Mich.

Continuation of Ser. No. 274,225, July 24, 1972, abandoned. This application Apr. 4, 1974, Ser. No. 457,858

Int. Cl.² B24D *3/08, 3/16*

U.S. Cl. 51—295 **9 Claims**



1. An abrading tool structure comprised of,

a base support member,

a plurality of spherical steel shot particles forming protrusions fixedly positioned on a surface of the base member, magnetically oriented abrasive grit particles positioned on an outer surface of the steel shot particles,

a metal bonding material holding the abrasive grit particles and steel shot particles in proper position, and

said abrasive grit particles being selected from at least one material of the group consisting of refractory metal carbide and metal boride grit particles, and

said grit particles including a magnetizable metal therewith selected from at least one material from the group consisting of iron, cobalt or nickel to provide for magnetically orienting said grit.

3,918,218

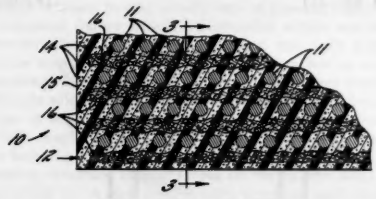
FILAMENTARY CUTTING TOOL CONTAINING SOLID MICROPARTICLES AND METHOD OF MAKING IT

Melvin Howard Zoiss, Oaklawn, Ill., assignor to Barnes Drill Co., Rockford, Ill.

Continuation of Ser. No. 72,970, Sept. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 868,976, Oct. 16, 1969, which is a continuation-in-part of Ser. No. 741,718, July 1, 1968, abandoned. This application Oct. 16, 1972, Ser. No. 297,862

Int. Cl.² C09K *3/14*

U.S. Cl. 51—298 **10 Claims**



1. In a filamentary cutting tool for use in performing a cutting operation on a workpiece comprising a matrix of a solid and relatively rigid thermosetting resin having embedded therein a plurality of elongated cutting filaments with a hardness of at least 250, as measured on the Knoop scale, greater than the workpiece all extending in substantially the same direction with the ends of the filaments being exposed at at least one surface of the matrix to cut a workpiece and wherein the matrix wears away in use to keep the ends of the filaments exposed, the improvement comprising a plurality of solid microparticles selected from the group consisting of glass, mica, metal, sand and carbon embedded in said matrix and present in an amount and size to allow the matrix to wear away in use and keep the ends of said filaments exposed while avoiding fragmenting and spalling of said matrix, the matrix with the microparticles embedded therein wearing away in use at about the same rate as the cutting filaments.

3,918,219

CATALYST SYSTEMS FOR SYNTHESIS OF CUBIC BORON NITRIDE

Robert H. Wentorf, Jr., Schenectady, and William A. Rocco, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 158,710, July 1, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,338The portion of the term of this patent subsequent to July 3, 1990, has been disclaimed.

Int. Cl.² B24D *3/02*; C04B *31/16*; C09C *1/68*; C09K *3/14*

U.S. Cl. 51—307 **8 Claims**

1. In the method for converting hexagonal boron nitride to cubic boron nitride wherein hexagonal boron nitride in the presence of catalyst material for the conversion thereof to cubic boron nitride is subjected to the simultaneous application of cubic boron nitride-stable pressures and temperatures, the improvement comprising:

a. making available as the catalyst material during the conversion a quantity of at least one alloy in which aluminum is combined with at least one alloying metal selected from the group consisting of cobalt, nickel and manganese, the ratio of aluminum to alloying metal being in the range of from 1 part by weight of aluminum: 2 parts by weight alloying metal to 1 part by weight of aluminum: 100 parts by weight of alloying metal, said alloy passing through a molten phase during said conversion, and

b. the quantity of hexagonal boron nitride to be converted is in contact as a mass with a mass selected from the group consisting of sintered carbide and sinterable carbide powder forming an interface therewith, the carbide portion of said sintered carbide or said sinterable carbide powder being predominantly of a material selected from the group consisting of tungsten carbide, titanium carbide, tantalum carbide and mixtures thereof,

whereby a composite cubic boron nitride/sintered carbide body is formed in situ wherein the cubic boron nitride is strongly bonded to the sintered carbide and whereby the interface of said composite between said cubic boron nitride and said sintered carbide is interlocking, free of voids and irregular on the scale of about 1–100 micrometers.

3,918,220

METHOD OF GRINDING A SURFACE OF A WORKPIECE AND A TOOL FOR CARRYING OUT THE METHOD

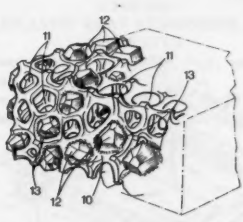
Kenneth James Jury, and Brian John Mottram, both of Coventry, England, assignors to Ryton Machine Tools (Coventry) Limited, Coventry, England

Filed Feb. 28, 1974, Ser. No. 446,918

Claims priority, application United Kingdom, Aug. 9, 1973, 37809/73

Int. Cl.² B24B *1/00*, *7/00*; B24D *11/00*; B24B *55/02*

U.S. Cl. 51—328 **5 Claims**



1. A method of grinding a surface of a workpiece with abrasive particles consisting in the steps of impregnating a pad of reticulated foam-like material having a plurality of interstices therein with said abrasive particles, said abrasive particles occupying only some of said interstices, said abrasive particles and said foam-like material respectively having hardnesses greater and less than that of the workpiece surface and those interstices which are unoccupied by said abrasive particles intercommunicating to define a continuous throughway extending between a rubbing surface of the pad and a face thereof remote from said rubbing surface, thereby to define a path through said pad for washing liquid applied thereto, effecting relative rubbing movement between said pad and the workpiece, whereby said foam-like material will be worn away during the rubbing movement to expose fresh abrasive particles and said unoccupied interstices in said rubbing surface of said pad, and applying said washing liquid to said rubbing surface of said pad, whereby material worn away from said pad and from the workpiece during the rubbing action will be washed from said rubbing surface of said pad by said washing liquid flowing through said unoccupied interstices in said pad.

3,918,221

THERMOSTATIC VENT VALVE

Gary L. Benjamin, Mount Blanchard, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

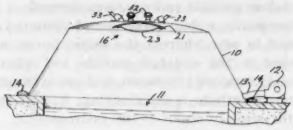
Filed Aug. 1, 1974, Ser. No. 493,699

Int. Cl.² E04B *1/345*

U.S. Cl. 52—1 **3 Claims**

1. In an air supported structure having side and ceiling surfaces and connected to a source of pressurized air, a temperature responsive ventilating valve comprising a flap of flexible material connected from its approximate center to the interior ceiling of the structure, at least one vent opening in the ceiling of the structure adjacent the upper surface of said

flexible flap, and a bimetallic strip below said flexible flap with its ends operably connected to the ends of said flap, said bimetallic strip defining an arcuate configuration with its concave surface disposed upwardly and its more thermally expansive surface disposed downwardly.



3,918,222

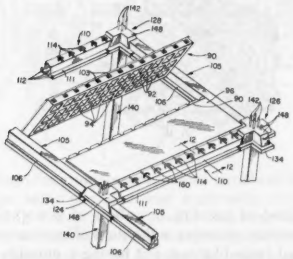
PREFABRICATED MODULAR FLOORING AND ROOFING SYSTEM

Bahram Bahramian, P.O. Box 15/1114, Tehran, Iran

Filed June 3, 1974, Ser. No. 475,430

Int. Cl.² E04G *21/00*; **E04C** *3/10*; **B21D** *39/00*

U.S. Cl. 52—227 **4 Claims**



1. In a prefabricated modular flooring system for a building structure, including a first set of parallel spaced elongated precast concrete beams disposed perpendicular to a second set of parallel spaced elongated precast concrete beams and cooperating to form a frame defining a bay, means for supporting the adjacent ends of said beams at the corners of said frame, a plurality of rectangular precast concrete floor slabs disposed in parallel horizontal relation within said frame and having opposite end portions mounted on said firrst set of beams for supporting one portion of the floor load by said first set of beams, each of said floor slabs including a plurality of laterally spaced longitudinally extending walls projecting downwardly from an integrally connecting substantially flat horizontal upper wall, each of said floor slabs further including a plurality of longitudinally spaced and laterally extending transverse walls projecting downwardly from said upper wall and integrally connecting said upper and longitudinally extending walls to define a plurality of longitudinally and laterally spaced downwardly facing cavities providing the bottom of said floor slab with a waffle-type configuration, and a set of elongated reinforcing members extending longitudinally within each said floor slab through said longitudinally extending walls, the improvement comprising a set of longitudinally spaced tubes extending substantially horizontally through said transverse walls of each said floor slab, said tubes within one said floor slab being in substantial horizontal alignment with the corresponding said tubes within each horizontally adjacent said floor slab, and elongated flexible post-tension cable extending continuously through each set of horizontally aligned said tubes within said floor slabs, and means for securing said cables to said second set of beams and said floor slabs after said cables are tensioned to provide for supporting another portion of the floor load by said second sets of beams and thereby produce a two-way distribution of the floor load to both said first and second sets of beams.

3,918,223

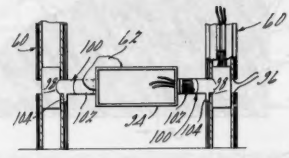
SECTIONAL STUD FOR MODULAR WALL SECTION

Sven A. Carlsson, Yonkers, N.Y., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Division of Ser. No. 289,761, Sept. 15, 1972, abandoned. This application June 3, 1974, Ser. No. 475,571

Int. Cl.² E04B *5/48*

U.S. Cl. 52—221 **19 Claims**



1. A preformed wall section for use in a modular building system, said wall section having

inner and outer skin panels formed with opposed inwardly rolled, re-entrant flanges,

an electrical receptacle box disposed behind an opening formed in one of said skin panels,

a pair of spaced sectional studs including

drive cleat means interlockingly connecting adjacent re-entrant flanges of said skin panels,

tubular chase members supporting said drive cleat means; and

adapter means connected to said receptacle box and to the chase members of said studs holding said box in register with the opening in said skin panel.

3,918,224

MOUNTING BAR SYSTEM FOR ATTACHING INTERIOR FITTINGS AND ELECTRIC WIRING TO A CONCRETE CEILING

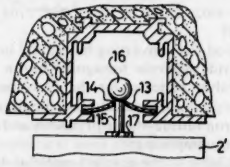
Ake Sundequist, Skovde, Sweden, assignor to Ake Sundequist Konsult AB, Skovde, Sweden

Filed Nov. 23, 1973, Ser. No. 418,703

Claims priority, application Sweden, Nov. 23, 1972, 15302/72

Int. Cl.² E04B *5/48*

U.S. Cl. 52—221 **7 Claims**



1. A dual-purpose electrical distribution/mechanical support system comprising a building structure having a ceiling fabricated of concrete, at least one elongated mounting bar fixedly embedded in said concrete ceiling, said bar having a substantially U-shaped cross section comprising a pair of substantially parallel sides the lower edges of which are spaced from one another to define an elongated opening therebetween located substantially flush with the interior surface of said ceiling, the exteriors of said parallel sides being substantially completely bounded by the concrete of said ceiling to

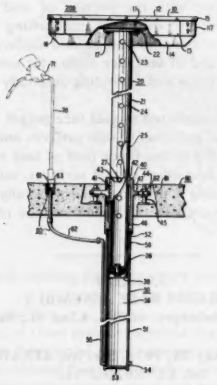
prevent said sides from spreading apart when outwardly directed forces are exerted on the interiors of said sides, a plurality of electrical conductors supported along the interior surfaces of said parallel sides above and spaced from said opening, the lower edges of said parallel sides defining a pair of inwardly extending support flanges adjacent said ceiling surface and below said conductors, at least one removable electrical plug extending through said opening for making electrical contact with said conductors to provide a source of electrical energization within said building structure, and suspension means removably supported by said flanges in spaced relation to said electrical plug and in non-contacting, spaced relation to said conductors to provide support for a mechanical fixture which is suspended within said building structure from said ceiling mounted bar, said suspension means comprising a strip-shaped member having a pair of opposing edges which engage said pair of flanges respectively adjacent said opening, said member being shaped between its edges to bulge away from said opening toward the interior of said U-shaped bar whereby forces exerted downwardly from the bulged portion of said member toward the interior of said building structure impose forces on the interior sides of said mounting bar in directions tending to spread said sides apart, said inwardly bulging portion of said member having at least one aperture therein, and a support element remvovably attached to said member at said aperture and extending through said opening toward the interior of said building structure for attachment to said mechanical fixture, said support element comprising a rod extending through said aperture and having a shaped head at its upper end for attaching said rod to said member.

3,918,225

MODULAR FLOOR SYSTEM

Jules Fisher, 255 W. 19th St., New York, N.Y. 10011, and Olaf Soot, 9 Tomahawk Lane, Greenwich, Conn. 06830

Filed June 22, 1973, Ser. No. 372,752
Int. Cl.² E04B *5/43;* **B66B** *9/04*
U.S. Cl. 52—126 **2 Claims**



1. In a modular floor system, a plurality of modular floor elements each of which can be lifted to and retained at a predetermined height and each comprising:

a vertically directed hollow cylindrical guide member including first vertical guide means, and seating means on the upper portion thereof;

a hollow cylindrical post adapted to be vertically slidable along the interior portion of said guide member, said post including second vertical guide means adapted to interact with said first vertical guide means, a plurality of uniformly spaced radially directed holes located along the post's length and 90° away from said first and second vertical guide means, first pin means fixedly attached to the post's upper external portion, and an air seal assembly located on the post's bottom portion, said first pin means being adapted to rest upon said seating means when said post is at its lowermost position;

a vertically directed hollow cylinder attached to the bottom portion of said guide member and having one closed end and one open end, said post's air seal assembly being slidable along the interior portion of said cylinder; and

means for supplying air to said cylinder, said cylinder including orifice means for allowing air to controllably escape from said cylinder;

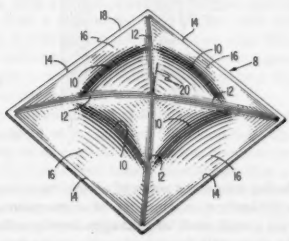
activation of said supplying means causing said post to be vertically raised relative to said guide member slightly above said predetermined height and said orifice means allowing said post to vertically drop to said predetermined height, second pin means being insertable into the hole corresponding to said predetermined height for resting on said seating means thereby retaining said post at said predetermined height.

3,918,226

THERMOPLASTIC HEAT RESPONSIVE FIRE VENT APPARATUS

Edward Sidney Naidus, Glen Rock, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 292,092, Sept. 25, 1972, abandoned. This application Jan. 9, 1974, Ser. No. 431,694
Int. Cl.² E04D *13/03*
U.S. Cl. 52—232 **2 Claims**



1. A fire vent apparatus for releaseably enclosing a building fire vent opening and capable of withstanding greater external loading such as snow and ice on said apparatus than does a simple convex dome without increased thickness or weight of material comprising:

a curb member defining said opening, said member having a vent cover receiving recess in communication with said opening, and

a thermoplastic heat responsive sheet vent cover member which softens and shrinks in the presence of temperatures elavated above ambient for exposing said opening in the presence of said elevated temperatures, said sheet member having a flange surrounding said sheet member received within said recess, said sheet member and said curb member being arranged for disengaging said received flange from said recess upon said softening and shrinking of said sheet member, said flange being disposed in a given plane and defining a substantially symmetrical figure, said sheet member comprising an, integral convex dome depending from said flange, said dome having a plurality of separate beam forming, external load-bearing troughs intersecting one another at about the center of said dome, each trough terminating at its ends solely adjacent said flange, said troughs and said flange forming a plurality of contiguous triangular convex dome-like sections in said convex dome, the intersection

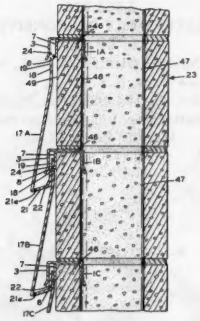
of said troughs being spaced vertically from said plane a first distance, and said flange the peaks of said convex sections being spaced vertically from said plane a second distance greater than said first distance, and said flange said convex sections, load bearing troughs and said first and second distances and said flange being arranged to provide the sole support for said integral, convex dome and to provide a vent apparatus which withstands greater external loading than does a simple, single convex dome of the same material and of the same thickness.

3,918,227

CLIP MEANS FOR MOUNTING PLASTIC OR METAL FACING MATERIAL ON BUILDING BLOCK STRUCTURES

Jack E. Gaston, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 10, 1973, Ser. No. 422,997
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—283 **4 Claims**



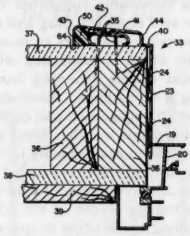
1. A facing means for walls of a building structure comprising in combination, a plurality of clips mounted in spaced relation on a wall, each of said clips having a flat top portion extending outwardly from said wall, means integral with and extending from the rear of said top portion adapted to be fastened to said wall, a front flange depending vertically from said top portion in spaced relation to said wall, and at least one depending wall-contacting flange positioned inwardly from said front flange and having an outwardly extending edge portion which terminates in spaced relation to said front flange, a plurality of thin material siding panels mounted on said clips, each of said siding panels having a substantially vertical top edge portion with horizontally aligned, elongated, spaced fastener apertures therein, a main body portion extending downwardly and outwardly at a slight angle from said top portion and a rearwardly facing hook-shaped butt edge portion which terminates in an upstanding flange, said siding panels being mounted on said clips by means of the fastener apertures in the top edge of a siding panel being positioned over the outwardly extending edge of the inwardly positioned flanges of the clips, said upstanding flange of the hook-shaped butt edge portion of a next higher course of panels being positioned in the space between said top edge of a siding panel mounted on said outwardly extending edges of the inwardly positioned flanges of the clips and the inner surface of the front flanges thereof whereby said front flange, and the outwardly extending edge of the inwardly positioned flange of the clip, the top edge of a siding panel mounted thereon and the upstanding flange of the butt portion of a next higher panel coact to hold the siding panels in locked-in-place, overlapped relation on the wall.

3,918,228

LINER FOR COVERING INTERSECTING SURFACES

Joseph N. LaBorde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 365,456, May 31, 1973, which is a division of Ser. No. 191,871, Oct. 22, 1971, Pat. No. 3,797,185. This application Nov. 6, 1974, Ser. No. 521,274
Int. Cl.[2] E04F *19/02*
U.S. Cl. 52—288 **20 Claims**



1. A liner for covering a portion of each of two intersecting surfaces comprising:

a. face means for abutting one of said surfaces, projection means on one end of said face means extending therefrom for contacting said one of said surfaces, said face means being adapted to receive separate corner block means on the inside thereof for coupling together separate sections of said liner;

b. return means connected to said face means for covering at least a part of the other of said surfaces, and means connected to the inner face of said return means for contacting said other of said surfaces; and

c. corner block means located on the inside of said face means for coupling together separate sections of said liner.

17. A liner for covering a portion of each of two intersecting surfaces, said liner having an inside surface which is substantially free of contact with the portion of said intersecting surfaces to be covered by said liner, comprising:

a. face means for abutting one of said surfaces, outer lip means on one end of said face means for contacting said one of said surfaces and extending generally parallel to a return means;

b. return means connected to said face means for covering at least a part of the other of said surfaces and, contacting means connected to the inner face of said return means for contacting said other of said surfaces, said contacting means comprising a protuberance generally rectangular in shape connected to the inside surface of said return means.

3,918,229

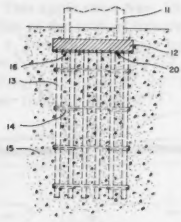
COLUMN BASE ASSEMBLY

Manfred P. Schweinberger, 407 N. 62nd St., Seattle, Wash. 98103

Filed May 28, 1974, Ser. No. 473,419
Int. Cl.[2] E02D *27/42*
U.S. Cl. 52—295 **6 Claims**

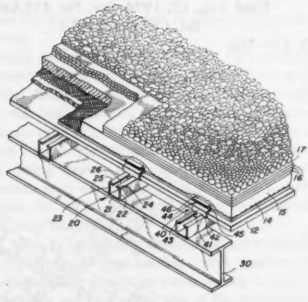
1. A column supporting assembly adapted to support a structural load bearing column or the like capable of withstanding vertical loads, shear forces and moment, said column supporting assembly comprising a flat relatively thick steel baseplate, said baseplate including a top, column supporting surface and a bottom surface, a plurality of steel reinforcing rods of substantial length rigidly connected in fixed position to said bottom surface and extending downwardly from said bottom surface substantially normal to said bottom surface of said baseplate, a concrete mass having a top surface area at least equal to the area of said baseplate surrounding said rods

and extending below the lower ends of said rods, a relatively thin compressible membrane positioned between the bottom surface of said baseplate and the top surface of said concrete mass whereby forces exerted on said column are transmitted through said baseplate to said rods and the membrane is compressed prior to the forces being exerted on said concrete and a substantial portion of the initial force that transfers through



said baseplate is gradually dissipated to the supporting concrete adjacent said rods thereby avoiding a concentration of the initial force on the concrete immediately underlying said baseplate and said membrane being formed from substances having a property of being less compression resistant and greater elasticity than the supporting concrete upon which the membrane is positioned.

3,918,230
BUILDING DECK CONSTRUCTION
Frank E. Carroll, Park Ridge, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.
Filed Oct. 18, 1974, Ser. No. 515,892
Int. Cl.² E04B *5/26*
U.S. Cl. 52—309 **13 Claims**



1. A poured building deck structure comprising the combination:

structural purlins;

sub-purlins of sheet metal structural shapes of a box section having a horizontal base, opposing vertical sides and upper horizontal flanges extending inwardly from the top of said sides forming an open slot between the terminus of said flanges, saud sub-purlins at right angles to and said base resting on top of said purlins;

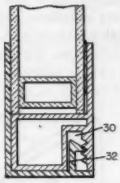
formboard adjacent to and secured against the top of said upper horizontal flanges of said subpurlins;

sheet metal clips having a vertical portion extending upwardly and downwardly from opposing slots, each of said opposing slots engaging one of said horizontal flanges of said box section when the axis of said clip and box section are at about 90° to each other, said upwardly extending vertical portion bending to a horizontal portion to engage the top of said formboard securing it against the top of said flanges, then bending to a substantially vertical upward portion and then bending to a substantially horizontal portion to provide uplift resistance when surrounded by concrete;

reinforcing mesh over the top of said clips; and

poured concrete above said formboard and engaging the upper portion of said clips.

3,918,231
FROST RESISTANT WINDOW SASH
Gerald Kessler, 388 Cranberry Road, Boardman, Ohio 44512
Continuation of Ser. No. 226,581, Feb. 15, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,135
Int. Cl.² E04C *2/00;* **E06B** *1/32*
U.S. Cl. 52—628 **1 Claim**



1. A frame construction for insulating and holding double-pane glass panels used as insulation between a cold space and a warm space, said frame construction comprising

b. a unitary, extruded metal frame member having a glass engaging strip portion shaped to extend against and in contact with a substantial area of the cold side of an enclosed double-glass pane adjacent an edge thereof, and an edge-retaining frame element extending generally at right angles to said strip portion for engaging the edge of such glass pane,

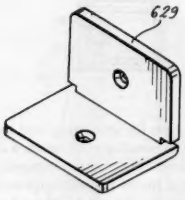
c. a unitary extruded rigid plastic frame member having a glass-engaging strip portion for extending against the warm side of an enclosed glass pane opposite to the side engaged by said metal frame member so that a double-pane glass panel will be held between said members near the edge thereof, said plastic member having an edge portion extending at right angles to said strip portion and overlying the outermost portion of the edge-engaging metal frame member,

d. means for fastening said metal frame member and said plastic frame member together comprising a bottom slot extending from the outermost side of the edge-engaging element of the metal member perpendicular to the plane of the edge of the glass pane, and a mating locking strip integral with said plastic member and engaged in said slot, said locking strip having a barb at one end thereof, and said slot having a ridged surface engagable by said barb to retain the locking strip in the slot, with a portion of the said metal frame element engaged between said locking strip and the glass-engaging strip portion of the plastic frame member to thereby hold said plastic frame member and said metal frame member together.

3,918,232
L-CONNECTOR FOR GROOVED STRUCTURAL ELEMENTS
Lindell N. Edwards, St. Louis, Mo., assignor to Universal Modular Structures, Inc., St. Louis, Mo.
Division of Ser. No. 222,113, Jan. 31, 1972, Pat. No. 3,821,868. This application Apr. 26, 1974, Ser. No. 464,691
Int. Cl.² E04B *1/40*
U.S. Cl. 52—738 **2 Claims**

1. A plural-arm locking member having two arms that are substantially equal in width and that are angularly displaced

from each other to subtend a dihedral angle therebetween, the side edges of one of said arms of said plural-arm locking member being dimensioned to simultaneously extend into and be confined by spaced-apart grooves which are defined by a wall and the adjacent ribs of a grooved structural element, the side edges of a second arm of said plural-arm locking member being dimensioned to simultaneously extend into and be confined by spaced-apart grooves which are defined by a wall and the adjacent ribs of a second grooved structural element which is angularly displaced from the first said grooved structural element to subtend a dihedral angle therebetween that is equal to said dihedral angle which is subtended by said arms of said plural-arm locking member, and inwardly-extending notches in said side edges of said one arm of said plural-arm locking member adjacent the junction of said one and said second arms of said plural-arm locking member, one of said notches having the inner end thereof spaced inwardly of the adjacent side edges of both said one and said second arms of said plural-arm locking member, whereby both of said adjacent side edges of both said one and said second arms of said plural-arm locking members are spaced outwardly of said inner end of said one of said notches, the other of said notches



having the inner end thereof spaced inwardly of the other adjacent side edges of both said one and said second arms of said plural-arm locking member, whereby both of said other adjacent side edges of both said one and said second arms of said plural-arm locking member are spaced outwardly of said inner end of said other of said notches, said notches being dimensioned to accommodate the confronting edges of said ribs of said second grooved structural element, the faces of said side edges of said one arm of said plural-arm locking member confronting and engaging portions of said wall or of said adjacent ribs of said first said grooved structural element whenever said plural-arm locking member is in locking position, the faces of said side edges of said second arm of said plural-arm locking member confronting and engaging portions of said wall or of said adjacent ribs of said second grooved structural element whenever said plural-arm locking member is in said locking position, whereby said side edges of said one arm and said side edges of said second arm of said plural-arm locking member can mechanically and directly coact with said walls and said adjacent ribs of said first said and said second grooved structural elements to limit tilting of said first said and said second grooved structural elements relative to each other.

3,918,233

CONSTRUCTION SYSTEM

Harold Graves Simpson, 8800 N. Kensington Road, Oklahoma City, Okla. 73132

Division of Ser. No. 336,364, Feb. 27, 1973. This application Feb. 4, 1974, Ser. No. 439,059

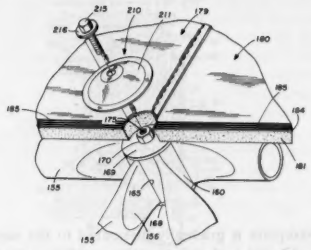
Int. Cl.[2] E04B *7/10*; **E04G** *21/14*

U.S. Cl. 52—747 **5 Claims**

1. The method of constructing a waterproof structure comprising:

erecting a supporting substructure having a plurality of support points arranged in a geometric pattern,

arranging a plurality of prefabricated, substantially rigid panels in contiguous edge-to-edge relationship, each panel having edges disposed adjacent at least three of the support points, each panel having a waterproof surface, at least a portion of the panels including a waterproof flexible flap extending from the waterproof surface such that at least one flap is provided for each adjacent pair of panel edges, the flaps extending along the respective edges of the panels between and terminating at the support points,



sealing the flexible flaps to the waterproof surface of the acjacent panels to form a continuous waterproof surface except for openings at the support points, and

fastening the panels to the support points of the substructure through the openings and sealing the openings at the support point to provide a continuous waterproof structure.

3,918,234

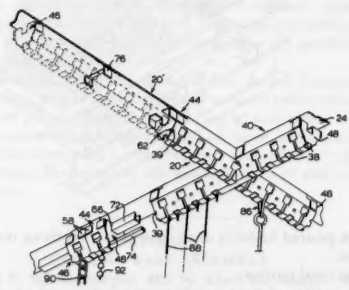
CLIP PRIMARILY FOR T-BAR CEILINGS

Sydney Joseph Weissman, 49 Apollo Drive, Don Mills, Ontario, Canada

Filed Aug. 12, 1974, Ser. No. 495,688

Int. Cl.[2] F16B *2/20*

U.S. Cl. 52—760 **15 Claims**



1. A clip for use in suspending lightweight articles from a support member forming part of a ceiling, wherein the clip is of relatively thin sheet form and has inclined sides defining a generally V-shaped symmetrical cross-section, wherein inwardly-directed flanges are provided at the upper ends of said sides, the clip being deformable to allow said flanges to be engaged over opposite side edges of a support member, and wherein at least one aperture is provided in the clip and is located at least in part on a line of symmetry of the cross-section of the clip so that, in use, an article can be engaged in said aperture and suspended from the clip, with its centre of gravity on said line of symmetry.

3,918,235
PROCESS FOR CONTINUOUSLY FORMING COMPARTMENTED PACKAGES

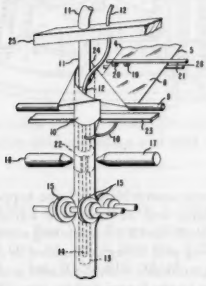
Theodore E. Brown, Jr., Mickleton, N.J., and Frank M. Willis, Hedgesville, W. Va., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 303,054, Nov. 2, 1972, Pat. No. 3,795,081. This application Nov. 19, 1973, Ser. No. 417,299. The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B65B *9/12*

U.S. Cl. 53—28 **7 Claims**



1. A process for forming a series of compartmented packages comprising:

a. continuously drawing a web of pliable film material into a convoluted cylindrical forming member having at least two tubular filling members passing therethrough, said film material being formed in said forming member into a convoluted tube into which said filling members extend and which has single-ply and double-ply wall portions, said web being drawn into, and said convoluted tube being continuously advanced through and past, said forming member by tube-advancing means in frictional engagement with said tube;

b. bringing said continuously advancing convoluted tube into a confronting relationship with sealing means adapted to produce a seal between facing surface zones of the inner ply and the outer ply of the double-ply wall portion of said tube in a manner such as to form, as the tube advances, a continuous linear juncture between plies adjacent the outer edge of said web substantially parallel to the longitudinal axis of said tube, said inner ply dividing said tube into compartments, and each of said filling members extending into a different one of said compartments;

c. continuously feeding a stream of fluent material into each of said filling members and discharging said material from said members into the compartments of said continuously advancing compartmented tube, the material fed into each filling member being different in composition from that fed into every other filling member;

d. bringing the filled portion of said continuously advancing compartmented tube into periodic engagement with constricting and sealing means which constricts the tube at spaced intervals and applies a pair of successive encircling closure means to each constricted area; and

e. severing said tube in the constricted areas between each pair of closure means.

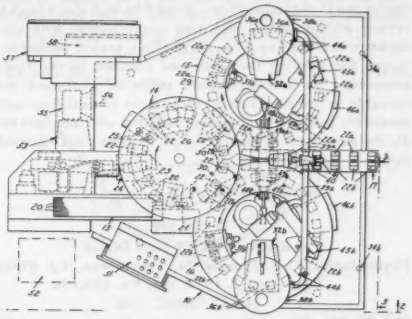
3,918,236
METHOD OF AND MACHINE FOR FORMING, FILLING AND CLOSING CONTAINERS

Robert J. Allen, Farmington, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 4, 1974, Ser. No. 520,707

Int. Cl.[2] B65B *3/02*

U.S. Cl. 53—29 **20 Claims**



1. A method of forming, filling and closing containers comprising the steps of:

a. intermittently advancing containers along a container bottom end forming rotary path into a plurality of bottom end processing stations for forming the bottom ends of the containers;

b. transferring simultaneously a first plurality of the bottom end formed containers into a first filler rotary path and a second plurality of the bottom end formed containers into a second filler rotary path; and,

c. intermittently advancing the botton end formed containers along the filler rotary paths into a plurality of filling and closing stations for filling and closing the containers.

3,918,237
MACHINE FOR THE MANUFACTURE OF FILLED AND SEALED CONTAINERS

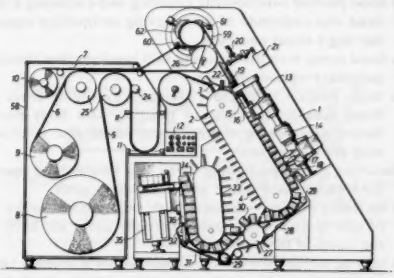
Sven Olof Soren Stark, Rydsgard; Jan-Erik Olsen, Lund, and Franz Soukup, Malmo, all of Sweden, assignors to Tetra Pak Development SA, Lausanne, Switzerland

Filed Jan. 16, 1974, Ser. No. 433,789

Claims priority, application Switzerland, Jan. 18, 1973, 696/73

Int. Cl.[2] B65B *61/18, 47/00*

U.S. Cl. 53—133 **21 Claims**



1. A machine for producing filled, sealed packages comprising means for progressively and continuously folding a first continuous web of packaging material into a series of successive, interconnected U-shaped sections extending transversely of the length of the web, feeder drum means for progressively

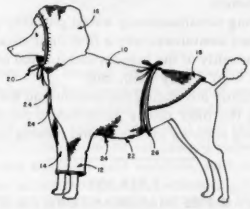
slitting a second web of packaging material transversely at the edges thereof in synchronism with the means for folding the first web, to provide a series of longitudinal opposed marginal flaps therealong, means for folding and sealing said flaps to the outer side edges of the U-shaped sections of the first web to form package cavities, means for filling said package cavities with a filling material, and means for sealing the filled packages by sealing the second web to the transverse ends of the legs of the U-shaped sections of the first web along lines transversely of the second web and coextensively with the slits between the flaps so as to form filled, sealed packages, said means for forming the U-shaped sections in the first web comprising an interconnected series of U-shaped moulds movable in the direction of movement of said first web and means for progressively folding said first web into said moulds during movement of said first web to form the U-shaped sections.

3,918,238

RAIN JACKET FOR DOGS

Phyllis Iozzio, 52 E. Prospect St., Hawthorne, N.J. 07506

Filed Aug. 2, 1974, Ser. No. 494,150
Int. Cl.² B68C *5/00*
U.S. Cl. 54—79 **4 Claims**



1. An improved protective garment for dogs, specifically a rain jacket for dogs, composed of flexible waterproof material, of the type having a body portion, a hood portion and fore leg portions, wherein the improvements of said portions comprise:

a hood portion substantially covering and enclosing a dog's head and underside of neck having an opening exposing the dog's snout and eyes;

a hood string member securing said hood portion about the periphery of said opening;

a body portion integrated with and extending from said hood near to the stifle of the dog, said body portion having an opening along a longitudinal line coincident with the dog's chest;

fastening means positioned along said longitudinal opening for securing said jacket about the dog's girth;

a back flap portion integrated with and attached to the rear of said body portion to substantially cover the back and the rump of the dog;

a rear tie string member contained within a seamed enclosure, positioned laterally with respect to the dog's body, at the juncture of said body portion and back flap portion and proximate to the rear opening of said forward body portion; and

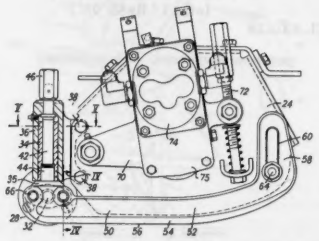
a tab means positioned at the juncture of said body portion and rear flap portion being coincident with the spine of the dog through which said tie string member is crossed and tied.

3,918,239

LAWN MOWERS

Edward John Aldred, and Julian Kowalski, both of Ipswich, England, assignors to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed Mar. 20, 1974, Ser. No. 453,095
Claims priority, application United Kingdom, Mar. 28, 1973, 14909/73
Int. Cl.² A01D *35/24*
U.S. Cl. 56—7 **8 Claims**



1. A lawn mower comprising a frame supported on ground-engaging members, and at least one cutting unit having a bottom cutting blade and a co-operating cutting cylinder, said at least one cutting unit being connected to the frame so as to be movable longitudinally with the frame and being supported by its connection to the frame and by ground-engaging means positioned to the rear of the bottom cutting blade and having height of cut adjustment means for adjusting the vertical position of the ground-engaging means relative to the bottom blade thereby to vary the height of cut of the cutting unit, in which said at least one cutting unit is provided with a pair of longitudinally extending skids mounted one at each side of the cutting unit, and means for adjusting the vertical position of the skids relative to the bottom blade while maintaining constant the angular orientation of each skid relative to the cutting unit, thereby in use to keep constant the height of the skids above level ground for different settings of the height of cut adjustment means.

3,918,240

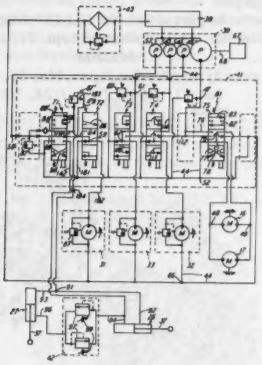
HYDRAULIC SYSTEM FOR A GANG LAWN MOWER

Donald G. Haffner, Glendale; Dean A. Meyer, Caledonia; Franklin A. Ecker, and Sahag C. Akgulian, both of Racine, all of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

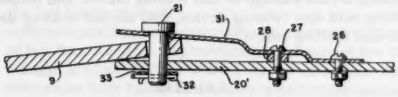
Filed Sept. 16, 1974, Ser. No. 506,261
Int. Cl.² A01D *35/24*
U.S. Cl. 56—7 **20 Claims**

14. In a hydraulic system for a gang lawn mower of the type including a tractor, a prime mover on said tractor, a plurality of lawn mowers pivotally supported on said tractor and with each of said mowers including a grass cutter, a mower hydraulic motor on each of said mowers and operatively connected with said grass cutters for powering said grass cutters, a hydraulic cylinder operatively associated with said mowers for pivoting said mowers between raised and lowered positions on said tractor, a hydraulic pump on said tractor and being drivenly connected with said prime mover to be powered thereby, a hydraulic valve on said tractor, a plurality of hydraulic lines interconnecting all said hydraulic motors and said cylinders and said pump and said valve, the improvement comprising a plurality of valve closure means included in said valve for respectively controlling the flow of fluid to said cylinders and said motors, two of said valve closure means being hydraulically interconnected and with one thereof controlling said

cylinders and the other thereof controlling one of said mower motors, and an additional valve hydraulically connected intermediate said two valve closure means for controlling the flow of hydraulic fluid to said cylinders and said one motor.

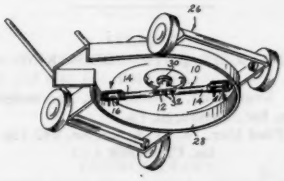


3,918,241
CUTTING UNIT FOR ROTARY LAWN MOWERS
Herbert C. Stillions, Box 114, Rome, Miss. 38768
Filed Oct. 16, 1974, Ser. No. 515,404
Int. Cl.² A01D *55/18*
U.S. Cl. 56—12.7 **10 Claims**



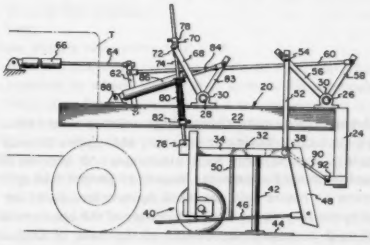
9. A cutting unit for a rotary lawn mower which has at least one depending, vertical, driven shaft comprising a central substantially planar mounting plate having means for centrally attaching said plate to the driven shaft of the lawn mower and apertures provided along the periphery of the mounting plate, a plurality of grass cutting blade units pivotally mounted along the periphery of said mounting plate and extending radially outwardly of said plate upon rotation thereof, each of said blade units comprising a linear blade portion having inner and outer ends, and an offset strap portion secured to the linear portion intermediate the ends thereof and extending in overlying relation to the inner end of the linear blade portion, aligned apertures in the overlying offset strap portion and linear blade portion, said portions being disposed in straddling relation to the periphery of said mounting plate and in alignment with one of the apertures in said mounting plate, pivot pin means extending through the apertures in said offset and linear portions, perpendicular to said linear portion and through said one of the apertures in the periphery of said mounting plate for pivotally securing said blade unit to said mounting plate, and quick disconnect means for positively locking said pivot pin means in position extending through said apertures in said offset and linear portions and said one of the apertures in said mounting plate, said pivot pin means being loosely fitted in said one of the apertures in said mounting plate to permit said pivot pin means and said blade unit to tilt relative to said mounting plate whereby when said cutting unit is mounted on said shaft and is still, the blade unit slopes downardly from the periphery of the mounting plate under its own weight, and when said cutting unit is rotated by said shaft, centrifugal force acting on said blade unit will tilt the blade unit and pivot pin means until the blade portion of the blade unit is parallel to the mounting plate and extends radially outwardly therefrom.

3,918,242
MATERIAL REMOVAL ATTACHMENT FOR A ROTARY MOWER
Edmond H. Harris, 2611 Johnson St., Elkhart, Ind. 46514
Continuation of Ser. No. 246,760, April 24, 1972, abandoned.
This application Aug. 14, 1973, Ser. No. 388,226
Int. Cl.² A01D *57/12*
U.S. Cl. 56—16.7 **9 Claims**



1. An attachment for a rotary mower traversable over the ground and having cutter blade drive means rotatable about a vertical axis, comprising a support member having a connector means and arm portions each extending laterally outwardly from said connector means and terminating in an end, said connector means for securing said support member to said blade drive means spaced above said ground for rotation about said vertical axis with said arm portions traveling in a plane generally perpendicular to said vertical axis, and slide means carried by each arm portion for shiftable movement along the arm portion between a retracted position adjacent said connector means and an extended position adjacent said end of the arm portion, each slide means being shiftable from its retracted position into its extended position at some speed of rotation of said drive means with said support member secured thereto, each slide means including material removal means shiftable into an inoperative position when said slide means shifts into its retracted position and an operative position when said slide means shifts into its extended position.

3,918,243
BEAN PULLER
Bernard Lemanski, 308 S. Silver, Bad Axe, Mich. 48413
Filed Aug. 22, 1974, Ser. No. 499,768
Int. Cl.² A01D *55/00, 45/22*
U.S. Cl. 56—229 **8 Claims**



1. A bean puller comprising an elongate fixed frame, transversely extending front and rear rock shafts mounted on said frame for pivotal movement about parallel horizontal axes normal to the longitudinal extent of said fixed frame, a windrower support frame, a root cutting knife supported by said

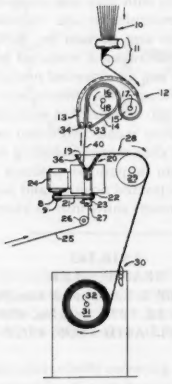
support shaft, front and rear link means respectively mounted upon said front and rear rock shafts and coupled to said support frame to suspend said support frame beneath said fixed frame, said front link means being pivotally coupled to said support frame adjacent the front end thereof and being operable upon pivotal movement of said front rock shaft to raise or lower the front end of said support frame relative to said fixed frame, said second mentioned link means being pivotally coupled to said support frame adjacent the rearward end thereof and being operable upon pivotal movement of said second rock shaft to raise or lower the rearward end of said support frame relative to said fixed frame, independently operable power means for independently pivoting said first and said second rock shafts, and third link means constraining movement of said support frame relative to said fixed frame.

3,918,244

METHOD AND APPARATUS FOR MAKING A BULKY YARN

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1974, Ser. No. 452,106
Int. Cl.² D01H *1/12*
U.S. Cl. 57—6 **33 Claims**



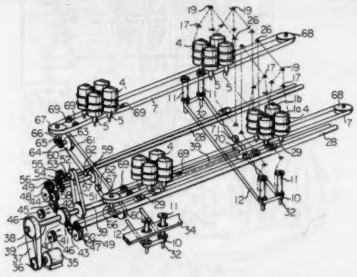
16. An apparatus comprising a high velocity attenuator, and inverted open cone having an aperture at the apex thereof and proximately spaced from said attenuator, to receive fibers projected from said attenuator, means to propel said attenuator, means to rotate said inverted open cone about an axis defined by the line connecting the center of the aperture at the apex of said cone and the center of the base of said cone, means for feeding a continuous fibrous strand through the aperture at the apex of said cone and in a direction opposite the direction of travel of said fibers from said attenuator, and means for collecting a yarn formed by the attenuated fibers being wrapped about and tangled around said continuous fibrous strand by said cone.

3,918,245

SIMULTANEOUS MULTIPLE TWISTING APPARATUS

Sakujiro Matsumura; Tadashi Yamamura, both of Nishio; Akira Ogura, Toyokawa, and Masataka Hayashi, Nishio, all of Japan, assignors to Toyo Tire Cord Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 362,107, May 21, 1973, Pat. No. 3,846,965. This application Sept. 11, 1974, Ser. No. 505,000
Claims priority, application Japan, May 26, 1972, 47-51680
Int. Cl.² D01H *1/10, 1/28, 7/86*
U.S. Cl. 57—58.54 **19 Claims**



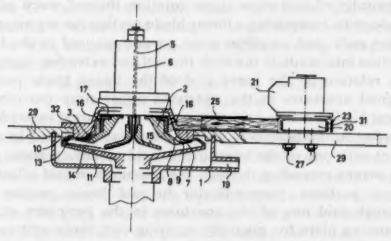
1. A multiple twisting apparatus having at least one twisting unit, comprising a first twisting device provided with at least two two-for-one twisting assemblies, each of said two-for-one twisting assemblies being provided with a first tension control means disposed therein, means for doubling first-twisted yarns withdrawn from said two-for-one twisting assemblies, a second twisting device disposed below said first twisting device for imparting a second twist to a doubled yarn carried from said means for doubling, means for positively feeding said doubled yarn to said second twisting device, a plurality of yarn guides forming a yarn passage behind said first twisting device and forming a yarn passage to said feeding means, and means for driving said first twisting device, said second twisting device and said feeding means.

3,918,246

SPINNING

Pierre Hubert Marie Joseph Bouhon, Heusy, Belgium, assignor to Societe Anonyme des Ateliers Houget Duesberg Busson, Verviers, Belgium

Filed Feb. 27, 1974, Ser. No. 446,510
Claims priority, application Belgium, Feb. 28, 1973, 796093
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 **4 Claims**



1. An arrangement in apparatus for spinning staple fibers comprising, feeding means with an opening-up roller rotatably arranged in housing means and having needle means on its outer periphery for feeding a fiber strand into said housing means and onto the outer peripheral wall of said opening-up roller; a spinning roller rotatably mounted in said housing means and having a conical flange surface bent inwardly at the

top; an exit tube for the yarn to be formed; means for adjusting the position of said feeding means relative to the spinning-up roller, said fiber strand feeding means comprising a rotating element with spiked feed roller for moving the fiber strand towards said opening-up roller, means for moving integrally and linearly said feeding means to vary the distance between the opening-position on said opening-up roller and said rotating element of said feeding means.

3,918,247

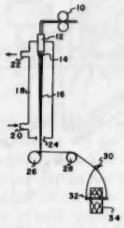
DRY SPUN PENTAGROOVED FILAMENTS

Jesse Louis Riley, Charlotte, N.C., and Howard Ray White, Jr., Pearisburg, Va., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 247,085, April 24, 1972. This application Feb. 8, 1974, Ser. No. 440,902

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—140 J **1 Claim**



1. An improved yarn comprising filaments of dry spun organic acid ester of cellulose, wherein the improvement comprises:

a. each said filament has five lobes extending substantially the full length thereof;

b. said yarn has the combination of a Tortuosity Coefficient of less than 2 and a Longitundinal Coordinate of less than 1.5 and a Close-Packed Bulked Factor of at least 1.45, where said Bulk Factor is the ratio of yarn cross-sectional area when said yarn is closely packed divided by the sum of each said filament's cross-sectional area;

whereby yarn luster and yarn cover power are increased, and streakiness is reduced.

3,918,248

MECHANISM FOR DRIVING A SPINNING ROTOR OF THE OPEN-END SPINNING APPARATUS

Yoshihisa Suzuki, Nagoya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, both of Osaka, Japan

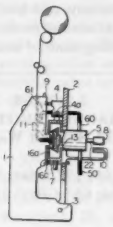
Filed Jan. 23, 1974, Ser. No. 435,950

Claims priority, application Japan, Jan. 27, 1973, 48-11409; Jan. 30, 1973, 48-12359

Int. Cl.[2] D01H *1/24, 1/12*

U.S. Cl. 57—101 **5 Claims**

1. In a mechanism for driving the spinning rotor of each spinning unit of an open-end spinning apparatus wherein a shaft of said rotor is rotatably supported by a pneumatic bearing mounted in a rotor holder of said spinning unit, the improvement comprising a cylindrical bearing member mounted to project inwardly in said pneumatic bearing whereby said rotor shaft is rotatably pneumatically supported by means of said cylindrical bearing member, a pair of cylindrical chambers formed in said pneumatic bearing at positions axially beyond opposite ends of said cylindrical member, a pair of flanges rigidly secured to said rotor shaft in the proximity of and beyond the axial ends of said cylindrical bearing member whereby said flanges are positioned in separate said cylindrical chambers, means for supplying pressurized air into a space between said rotor shaft and said cylindrical bearing member and also into spaces between said flanges and said cylindrical bearing member in uniform condition, means for discharging said supplied air from said spaces to the outside of said pneumatic bearing, and means for sealing a clearance between said rotor shaft and said pneumatic bearing at both ends of said pneumatic bearing.



3,918,249

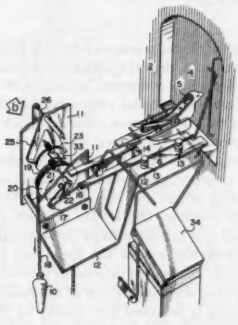
CUCKOO CLOCK

Isao Masuyama, 5075, Ohaza, Ishioka, Ibaragi, Japan

Filed July 26, 1974, Ser. No. 492,248

Int. Cl.[2] G04B *21/08*

U.S. Cl. 58—12 **3 Claims**



1. In a cuckoo clock, a bird-displaying mechanism comprising:

a clock housing having an aperture in the front wall thereof;

door means pivotally mounted on said front wall adjacent said aperture to move between a first position closing said aperture and a second position opening said aperture, said door means including means biasing said door means to said first position;

a bird;

plate means supporting said bird;

means constraining said plate means to slide between a first position in which said bird is completely concealed behind said closed aperture and a second position in which said bird is substantially completely exposed exteriorly of said housing, said plate means moving said door means from said first position to said second position and moving said bird through said aperture while sliding between said first and second positions;

drive means for reciprocally sliding said plate means from said first position to said second position comprising a gear train, a rotatable crank arm connected at one end to a shaft of said gear train and rotatably coupled at the other end to a first end of a connecting rod, the second end of said connecting rod being rotatably coupled to said plate means;

locking means coacting with said gear train to permit said crank arm to rotate through 180° increments and to lock

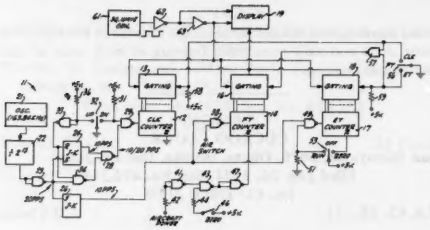
said gear train at the ends of said increments, said ends of said increments corresponding to said plate being positioned in said first and second positions, respectively; and means for releasing said locking means at preselected time intervals, whereby said bird is displayed from said first position to said second position and back to said first position at the tolling time of said cuckoo clock.

3,918,250

MULTI-CHANNEL DIGITAL CLOCK

David N. Torresdal, 427 Hillcrest Way, Redwood City, Calif. 94062

Filed Oct. 10, 1973, Ser. No. 404,920
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **14 Claims**



1. In a digital clock, a source of clock pulses occurring at a predetermined rate, digital display means comprising a plurality of digital display elements arranged in first and second groups, a plurality of digital counters, means for applying the clock pulses to the counters whereby each counter can advance independently of other counters to provide a count corresponding to the length of time the clock pulses are applied to that counter, each of the counters comprising a plurality of counting stages for registering different digits of the count in the counter, the stages in each counter being arranged in first and second groups corresponding to the groups of display elements, means for providing a cyclical control signal, manually controlled means for providing counter selection signals representative of one of the counters whereby one of the counters is selected for display of the count therein, gating means connected to said counters, said gating means being responsive to the control signal and to the counter selection signals for applying the counts from the first and second groups of stages in the selected one of the counters to the display means during first and second portions of the cycle of the control signal, respectively, means responsive to the control signal for conditioning the first and second groups of display elements to display the counts applied to the display means during the first and second portions of the control signal cycle, respectively, means for supplying operating power to the clock from an external source, a battery, and means for supplying operating power from the battery to a portion of the clock including the pulse source and at least one of the counters and excluding the display elements in the absence of power from the external source whereby said counter continues to operate notwithstanding the absence of external power.

3,918,251

DIGITAL WORLD CLOCK

Yasuo Wakabayashi, F-191 Kamakurazushi Hai-land 1362-293, Hisaki, Zushi, Kanagawa, Japan

Filed Apr. 5, 1974, Ser. No. 458,214
Claims priority, application Japan, Apr. 12, 1973, 48-43181[U]
Int. Cl. G04b *19/22*, *19/02*
U.S. Cl. 58—42.5 **11 Claims**

1. A digital world clock comprising:

a table indicating world standard time zones, attached to the casing of a clock and including 24 equalled spaced divisions;

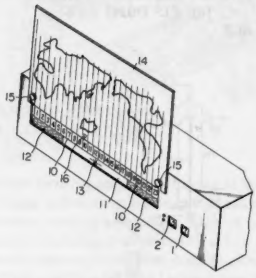
an endless film band trained around a pair of spaced pulleys said endless film band being positioned in side-by-side relation to said table for ready reference;

said film band having thereon two longitudinally extending juxtapositioned zones

one of said zones being divided into 48 divisions each representing an hour

the other of said zones being divided into four parts representing sequentially night and day;

whereby the run of said film band on one side is visible to a user and indicates thereon a length of 24 divisions representing the span of 24 hours in time as well as the parts representing night and day;



said clock casing having a pair of openings;

digital minute-indicating means associated with said openings, displaying digits representing respectively 00 to 59 minutes in combination;

including a pair of drums bearing said digits on their outer circumferential surfaces;

one of said drums attending to digits of the first order ranging from 0 to 9 and the other of said drums attending to digits of the second order ranging from 0 to 5;

gear means interconnecting one of said pulleys and one of said drums whereby the instant said two drums come to positions indicating 00 minute in combination said one pulley will rotate to advance said film band a longitudinal distance corresponding to one hourly division of said film band.

3,918,252

DIGITAL CLOCK OR OTHER COUNTING DEVICE WITH RESILIENT COUPLING MEANS IN THE DRIVE TRAIN

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Mar. 6, 1974, Ser. No. 448,749
Int. Cl.² G04B *19/02*, *19/00*; G06C *15/26*
U.S. Cl. 58—125 C **9 Claims**

7. A transfer counter such as a clock, which comprises, in combination:

a plurality of register drums rotatably arranged in progressively increasing order with each other;

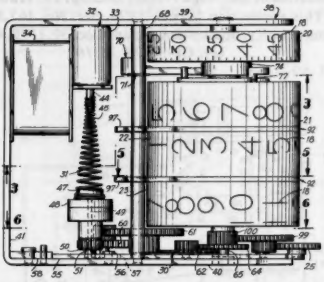
first transfer means interconnecting the lowest order drum with the adjacent higher order drum, the first transfer means including a compensating cam secured to the side of the lowest order drum facing said adjacent drum, first drive means secured to the side of the adjacent drum facing said lowest order drum, and a resiliently biased transfer mechanism controlled by the compensating cam for rotating said first drive means only during a selected portion of the rotation of the lowest order drum;

second transfer means interconnecting said adjacent higher order drum with the next higher order drum, the second transfer means including second drive means secured to the side of said next drum facing said adjacent drum and a Geneva transfer mechanism for rotating the next drum

only during a selected portion of the rotation of said adjacent drum;

speed reducing means including a gear train in driving relationship with the side of the lowest order drum opposite that facing said adjacent drum;

means including a stepper motor having a rotary output shaft rotatable in discrete increments of motion for operating the gear train; and



a resilient coupling between the motor output shaft and the speed reducing means for permitting relative rotational movement therebetween, the speed reducing means remaining stationary during the initial portion of the operation of said output shaft, then accelerating during a succeeding portion of said operation, and thereafter continuing its movement upon the termination of each said increment under the control of said resilient coupling.

3,918,253

FUEL SYSTEM FOR A GAS TURBINE ENGINE

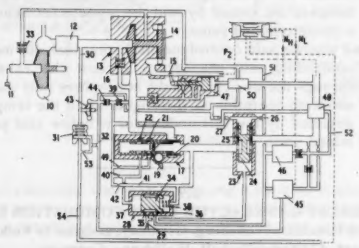
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Apr. 30, 1974, Ser. No. 471,720

Claims priority, application United Kingdom, May 16, 1973, 23265/73

Int. Cl.² F02C *9/08, 9/10*

U.S. Cl. 60—39.28 R **7 Claims**



1. A fuel control system for a gas turbine engine, including a pump, a main fuel throttle valve having a control member movable to vary the resistance thereof to fuel flow, a servo-throttle valve including a spool controlling ports connected in series with the main throttle valve, a first fluid flow circuit connected between the outlet of the pump and the inlet of the pump and including a pair of flow restrictors in series, one end of the servo-throttle valve spool being acted upon by the pressure existing intermediate said flow restrictors, a pressure-drop sensitive valve having a spool the two ends of which are acted upon by pressures derived from the pressures existing respectively upstream and downstream of the main throttle valve, the pressure-drop sensitive valve controlling flow between two ports therein, a third flow restrictor connected between one of said ports and the outlet of the pump, the other of said ports being connected to the inlet of the pump, said pressure-drop sensitive valve and said third flow restrictor forming part of a second fluid flow circuit also connected between the outlet of the pump and the inlet of the pump, the other end of the servo-throttle valve spool being acted upon by a servo control pressure intermediate said third restrictor and the pressure-drop sensing valve, said pressures acting on the ends of the servo-throttle valve spool being substantially the only forces on said spool.

3,918,254

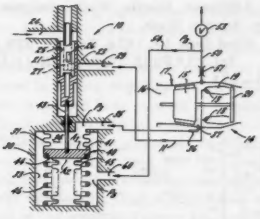
FUEL CONTROL FOR A GAS TURBINE HAVING AUXILIARY AIR BLEED

Donald E. Wernberg, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed May 16, 1974, Ser. No. 470,582

Int. Cl.² F02C *9/08*

U.S. Cl. 60—39.28 R **9 Claims**



1. A control for regulating the rate of fuel flow to the burners of a gas turbine having a compressor discharge section and having a valved bleed passage communicating with said compressor discharge section to deliver a variable amount of air from said compressor discharge section for auxiliary use, said control comprising a fuel regulating element displaceable to different positions to control the rate of fuel flow to said burners, and means for detecting the weighted difference between the pressure P_3 in said compressor discharge section and the pressure P_B in said bleed passage and for causing said fuel regulating element to be displaced as a predetermined function of changes in said weighted difference.

3,918,255

CERAMIC-LINED COMBUSTION CHAMBER AND MEANS FOR SUPPORT OF A LINER WITH COMBUSTION AIR PENETRATIONS

Abe N. Holden, Broomall, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 6, 1973, Ser. No. 377,172

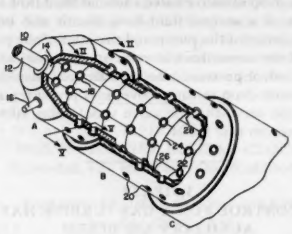
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F02C *1/00*

U.S. Cl. 60—39.65 **5 Claims**

1. A combustion chamber for a gas turbine engine comprising; an outer cylindrical wall portion forming the outer casing of said combustion chamber, an intermediate generally cylindrical wall portion disposed radially inwardly of and adjacent said outer wall portion, an inner generally cylindrical wall portion disposed radially inwardly of and adjacent said intermediate wall portion, said inner wall portion comprising interlocking members, said interlocking members being stabilized within said chamber by a plurality of inlet air tube-like bushings, said bushings providing air passageways from the outside of said outer casing to the inside of said inner wall portions,

said bushings having retaining means for keeping the inner wall portions in close relationship to the intermediate and



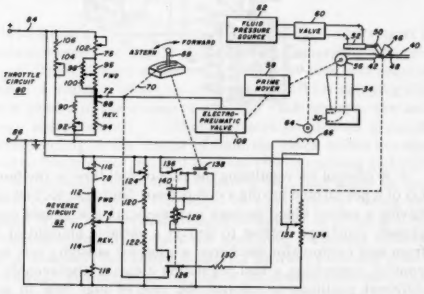
external wall members, said bushing being constructed from a ceramic material.

3,918,256

THROTTLE-REVERSER CONTROL SYSTEM FOR WATER JET PROPELLED SEACRAFT

Francis C. Ashleman, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 10, 1974, Ser. No. 478,171
Int. Cl.² F02K 1/20; B63H 11/10
U.S. Cl. 60—221 **6 Claims**



1. In a ship propulsion system of the type in which water is scooped from a body of water traversed by the ship, energy is added to the water by means of a pumping element driven by an engine, the water is discharged in the form of a driving jet to propel the ship, and reverser bucket means is provided to selectively and controllably move into the path of travel of the driving jet to reverse the thrust of the ship; the improvement in control means for side driving engine and reverser bucket means comprising:

first means including electrically operated valve means for controlling the speed of said engine and the amount of energy added to the water by said pumping element;

second means including electrically operated valve means for controlling movement of said reverser bucket means into the path of travel of said driving jet;

a throttle having neutral, forward and reverse positions;

first potentiometer means having a wiper element operatively connected to said throttle and having a shorted central section on either side of the neutral position of said wiper and connected to the first means for controlling the speed of said engine whereby the engine will idle at the neutral position and in regions on either side of neutral; and

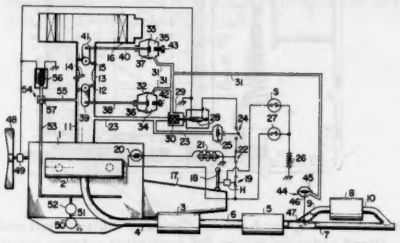
second potentiometer means having a wiper element operatively connected to said throttle for controlling the position of said reverser bucket means and having shorted sections on either side of a central resistive section whereby, as said throttle moves through said regions on either side of neutral, the reverser bucket means will move from a fully retracted position for forward thrust to a fully extended position for reverse thrust.

3,918,257

EXHAUST GAS PURIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yutaka Hirose, and Shigetake Yoshimura, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Continuation of Ser. No. 214,116, Dec. 30, 1971, abandoned.
This application May 6, 1974, Ser. No. 467,545
Claims priority, application Japan, Dec. 30, 1970, 45-129501
Int. Cl.² F02B 75/10
U.S. Cl. 60—284 **9 Claims**



1. An exhaust gas purifying device for an internal combustion engine having; at least one combustion chamber, at least one ignition plug disposed in each combustion chamber, a carburetor including a choke valve and a throttle valve for controlling the flow of fuel and air mixture to each combustion chamber, a silencer for preventing exhaust gas noise during warming operation of the engine, and a reactor downstream of said at least one combustion chamber receiving the exhaust gas therefrom, said device comprising:

a. means for maintaining ignition of said at least one ignition plug for each combustion chamber during warm up,

b. a thermodetector for detecting the temperature of the engine or the reactor,

c. control means for supplying to each combustion chamber a large volume fuel and air mixture during warm up to maintain the engine speed above 2,500 rpm, and

d. means for operating said control means in response to temperature sensed by said thermodetector being below a predetermined value,

and wherein said control means further includes means for controlling said silencer to exhaust the exhaust gas through the silencer into the atmosphere only during the warming operation of the engine when the temperature detected by the thermodetector is below said predetermined value.

3,918,258

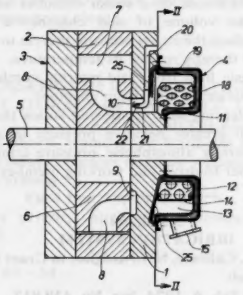
EXHAUST GAS REACTOR FOR A COMBUSTION ENGINE

Erich Gaschler, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 281,105, Aug. 16, 1972, abandoned.
This application June 13, 1974, Ser. No. 479,250
Claims priority, application Germany, Sept. 1, 1971, 2143731
Int. Cl.² F01N 3/10
U.S. Cl. 60—305 **9 Claims**

1. A combustion engine of the rotary piston type in combination with an exhaust gas reactor, having a longitudinal axis, the combustion engine comprising an exhaust gas outlet channel having a secondary air inlet thereto for mixing the exhaust gas with secondary air for improved burning thereof in the exhaust gas reactor, a side plate means on said combustion engine mounted at the side of said exhaust gas outlet channel, said exhaust gas reactor comprising a casing having an annular shape formed about said axis and defining an open end surface

substantially perpendicular to said axis, said exhaust gas reactor being mounted directly on said side plate means, said open



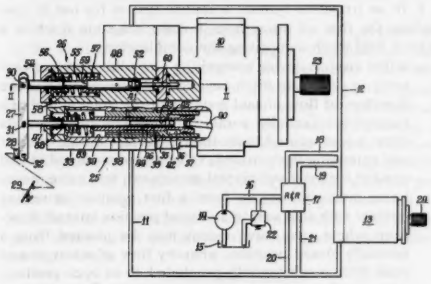
end surface of the exhaust gas reactor casing lying against the side plate means and communicating with the exhaust outlet channel of said combustion engine.

3,918,259

HORSEPOWER-LIMITING VALVE AND LINKAGE THEREFOR

Cyril W. Habiger, and Donald L. Hopkins, both of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 26, 1974, Ser. No. 500,326
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **10 Claims**



1. In a hydrostatic transmission having a variable displacement axial piston pump in continuous open fluid communication with a rotary hydraulic motor, a control system comprising:

a servo-actuator operatively connected for varying the displacement of said variable displacement pump;

a servo-valve for controlling said servo-actuator;

manual control means for selectively positioning said servo-valve;

pressure-responsive actuator means responsive to the pressure output of said pump for overriding said manual control means for reducing the displacement of said variable displacement pump; and,

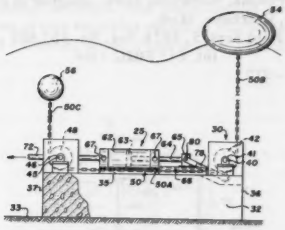
lever means for pivotally interconnecting said servo-valve, said manual control means, and said pressure-responsive actuator wherein the pivotal connection of said lever to said pressure-responsive actuator means serves as movable fulcrum means for moving said lever in proportion to the pressure output of said pump for overriding said manual control means.

3,918,260

WAVED-POWERED DRIVING APPARATUS

Klaus M. Mahneke, 228-66th St., Delta, British Columbia, Canada

Filed Dec. 30, 1974, Ser. No. 537,578
Int. Cl.² F03G *7/00*
U.S. Cl. 60—500 **5 Claims**



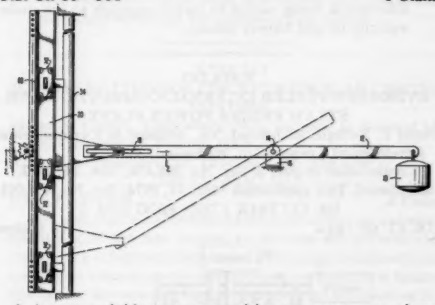
1. Wave-powered driving apparatus comprising anchor means adapted to be supported in a body of water the surface of which is subject to wave action, a rotatable device secured to the anchor means, a flexible member having an intermediate portion thereof in driving engagement with the rotatable device, a first and a second float secured to opposite ends of the flexible member and cooperating with the rotatable device whereby said flexible member normally is supported in a substantially U-shaped configuration, said first float riding on the water surface and having greater buoyancy than the second float whereby said second float is maintained submerged below the surface of the water and above the rotatable device during variations in tide and wave actions, and power take-off means operatively connected to the rotatably device.

3,918,261

WAVE AND TIDE MOTOR

Vernon Bailey, 2424 Peach Orchard Road, Augusta, Ga. 30906

Filed Apr. 10, 1974, Ser. No. 459,494
Int. Cl.² F03G *7/00*
U.S. Cl. 60—506 **1 Claim**



1. A wave and tide motor comprising support means, a lever pivoted intermediate the ends thereof on said support means, float means connected to one end of said lever, rack means, guide means for guiding said rack means for vertical reciprocatory movement, lost-motion connecting means connecting said rack means to the other end of said lever, pinion means operatively engaged with said rack means and power output shaft means connected to said pinion means, said rack means being comprised of an elongated hollow rectilinear C-shaped channel member having a rack on one exterior surface thereof and said guide means being comprised of a fixed post having a plurality of spaced apart guide blocks thereon disposed within said hollow channel member and a plurality of roller

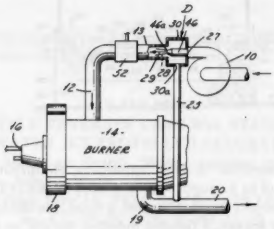
elements journalled in said guide block for a rolling engagement with each of the interior surfaces of said hollow channel member.

3,918,262

HOT EXHAUST GAS RECIRCULATING SYSTEM FOR A STIRLING ENGINE

Norman D. Postma, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 5, 1974, Ser. No. 503,589
Int. Cl.² F02G *1/04*
U.S. Cl. 60—517 **3 Claims**



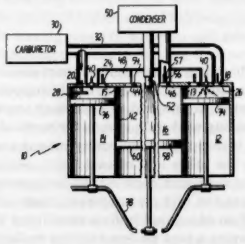
1. In a Stirling type engine, having an external heating system for operating a closed high pressurized working gas system, the combination comprising:
   a. a heat source circuit having an induction portion, a combustion portion and an exhaust portion,
   b. variable speed blower means in said circuit having an outlet, said blower means being effective to draw ambient air along a streamline into said induction portion,
   c. a recirculation passage connecting said exhaust portion and induction portion, and
   d. connection means having an aspirator, said means providing a joint between said recirculating passage, induction portion, and blower outlet, said aspirator being located at the immediate outlet of said blower to maximize flow velocity and provide a variable pressure differential between the pressurized low temperature blown air and the high temperature low pressure exhaust gases, said differential being varied in direct response to the outlet velocity of said blower means.

3,918,263

HYDROGEN-FUELED INTERNAL-COMBUSTION AND STEAM ENGINE POWER PLANT

Benny F. Swingle, Richmond, Va., assignor to Environmental Development Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 306,436, Nov. 14, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,001
Int. Cl.² F01K *27/00*; F02G *3/02*
U.S. Cl. 60—614 **18 Claims**



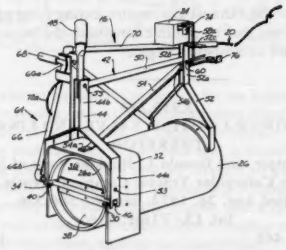
1. A method of driving a working member comprising the steps of:
   igniting a fuel of high hydrogen content in an internal combustion chamber thereby producing a large amount of steam which expands said internal combustion chamber to drive said working member;
   transferring said steam to a steam chamber and therein expanding the volume of said chamber a sufficient amount to reduce the steam pressure therein to a negative pressure and thereby reduce its temperature;
   transferring waste heat from said internal combustion engine to said steam in said steam chamber;
   thereafter condensing said transferred steam thereby producing a still greater negative pressure in said steam chamber whereby atmospheric pressure contracts said steam chamber to drive said working member.

3,918,264

IRRIGATION SYSTEM

Don L. Bradshaw, Caliente, Nev., assignor to Grant C. Tucker, Cedar City, Utah

Filed Feb. 6, 1974, Ser. No. 439,917
Int. Cl.² E02B *13/00*; F16K *51/00*
U.S. Cl. 61—12 **15 Claims**



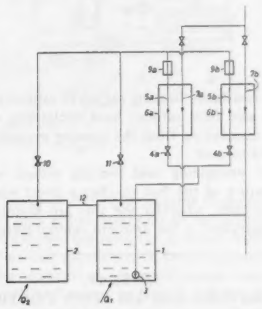
1. In an irrigation system, a control system for use in controlling the flow of water from a main irrigation ditch to a branch field ditch comprising the combination:
   a. a first control device comprising a conduit disposed centrally in said main ditch beyond said branch ditch in the direction of flow of said water with the longitudinal axis thereof substantially parallel to the axis of said main ditch, a seal secured to the interior surface of said conduit and extending therearound, valve means mounted in said conduit for axial and pivotal movement, said valve means being moveable axially from a first position in sealing contact with said seal to a second position spaced therefrom where said valve means may be pivoted from a normally closed position, whereby flow of water in said main ditch is substantially precluded, to an open position, whereby flow of water in said main ditch is allowed, means to axially move said valve means, means to pivot said valve means, and timer means to actuate said means to axially move said valve means;
   b. a second control device comprising a conduit disposed centrally in said branch ditch with the longitudinal axis thereof substantially parallel to the axis of said branch ditch, a seal secured to the interior surface of said conduit and extending therearound, valve means mounted in said conduit for axial and pivotal movement, said valve means being axially moveable from a first position spaced from said seal where said valve means may be pivoted from a normally open position, whereby flow of water from said main ditch through said conduit and through said branch ditch is allowed, to a closed position, whereby flow in said branch ditch is substantially precluded, to a second position in sealing contact with said seal, means to pivot said valve means, and means to axially move said valve means; and
   c. means joining said means to pivot said valve means of said first control device to actuate said means to pivot said valve means of said second control device;

whereby water flowing in said main ditch is diverted by said first control device in said main ditch, which is normally closed, through said second control device in said branch ditch, which is normally open, and into said branch ditch, until said timer means of said first control device opens said first control device and said second control device is subsequently closed.

3,918,265
COMPENSATION OF REFRIGERATION LOSSES DURING THE STORAGE OF LIQUEFIED, LOW-BOILING GASEOUS MIXTURES

Volker Etzbach, Munich, and Karlheinz Muller, Egling, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 10, 1973, Ser. No. 423,395
Claims priority, application Germany, Dec. 11, 1972, 2260516
Int. Cl.² F17C *13/00*
U.S. Cl. 62—54 **8 Claims**



1. A process for the compensation of the refrigeration losses to the surroundings during the storage of liquefied, low boiling gaseous mixtures in a plurality of storage means, each having a vapor space and a lower zone for said liquefied gaseous mixture, the vapor spaces thereof being in communication with each other, said process comprising withdrawing said liquefied mixture from only one storage means, subcooling said liquefied mixture, and recycling subcooled liquefied mixture into all of the plurality of storage means, with the provision that a larger portion of subcooled gaseous mixture is recycled into the storage means from which the liquefied gaseous mixture is withdrawn, then into each of the remaining storage means.

3,918,266
ICE WEIGHING MACHINE

Irving W. Gindy, and Edwin L. Lauterstein, both of San Antonio, Tex., assignors to Gindy Distributing Company, San Antonio, Tex.

Continuation-in-part of Ser. No. 311,333, Dec. 1, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,681
Int. Cl.² F25C *1/00*
U.S. Cl. 62—137 **8 Claims**

1. An ice cube dispensing and weighing machine connected to a source of power and water, said machine comprises;

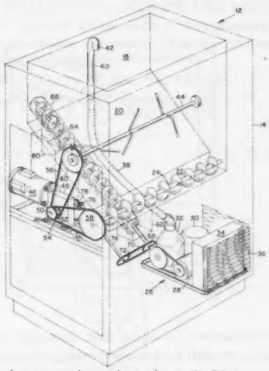
a. refrigeration means for forming ice cubes from said water;

b. a bin positioned to receive ice cubes from said refrigeration means;

c. means for discharging ice cubes from said bin into a container, said discharging means being driven by said power source;

d. means for weighing the ice contained in said container, said weighing means including a force control switch supporting said container, said container upon receiving a predetermined amount of ice cubes therein activates said force control switch to terminate power to said discharging means, said force control switch including switching means and means for rigidly mounting said switching means and further means for accurately setting said switching means operation point, said force control switch having accurate repeatability over extended use;

e. control means for selecting one of a variety of said predetermined amounts, said force control switch having a series of said switching means so that when the weight of said ice cubes forces a first portion of said force control



switch toward a second portion, the switching means will activate as said predetermined amounts are reached, said power to said discharging means being terminated upon reaching the selected predetermined amount;

f. time delay cut off means interconnected with said control means so that, if a sufficient amount of time has passed so that under worst case conditions said selected predetermined amount would have been dispensed, power to said discharging means is terminated; and

g. said first portion of said force control switch will flex as the weight increases while said second portion provides said rigid mounting for said switching means.

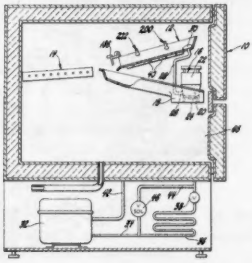
3,918,267
ICE-MAKER CONTROL CIRCUIT WITH SLAB LIMITING CONTROL

James A. Canter, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 524,529
Int. Cl.² F25C *1/12*
U.S. Cl. 62—138 **4 Claims**

1. A slab thickness limiting control circuit for an automatic ice maker of the type having an inclined refrigerated plate cooled by a refrigerant circuit and with water circulated thereover by an electric motor driven pump to build up a finished slab of ice thereon and further including an inclined ice cutting grid to receive the ice slab from the refrigerated plate when released therefrom by hot gas defrost means and with the grid serving to cut the slab into individual cubes comprising; first and second mercury ice thickness control thermostatic control switches, a normally opened grid switch being closed when a slab of ice is receiver on the cutting grid from the freezing plate, a first transistor having a base, an emitter and a collector, a second transistor having a base, an emitter and a collector, a DC power source including first and second terminals thereon, means including first and second biasing resistors connected respectively to the base of said first transistor and the base of said second transistor, normally closed

first switch means for connecting the base of said first transistor to said first mercury ice thickness control thermostatic control switch, means including second switch means having a normally closed contact for energizing the refrigerant circuit to cool the plate and a normally open contact operable to a closed position for defining an electrical path for conditioning the hot gas defrost means to defrost the refrigerated plate during a slab release cycle of operation, said first mercury ice thickness control thermostatic switch being positioned a first preselected distance above the refrigerated plate to detect a buildup of a first predetermined thickness of ice in the slab and operative to open to produce a bias on the base of said first transistor when the grid switch is normally open to cause said transistor to be forwardly biased, means including a coil connected in circuit relationship with the emitter and collector of said first transistor and operable when said first transistor is conductive to open said normally closed first switch means and to shift said second switch means from its normally closed contact to its normally open contact, said second ice thickness control thermostatic switch being positioned a preselected greater distance above the refrigerated plate than said first ice thickness control thermostatic switch to detect an excessive slab thickness, means including said second ice thickness control thermostatic switch for producing a negative bias on the base of said transistor to cause said second transistor to be triggered conductive, a third normally closed switch means in series with said first switch means and being maintained normally closed to complete the water pump motor circuit, means responsive to said second transistor being triggered conductive to open said third switch means to deenergize said water pump when an excessive ice buildup is detected by said second ice thickness control thermostatic switch.



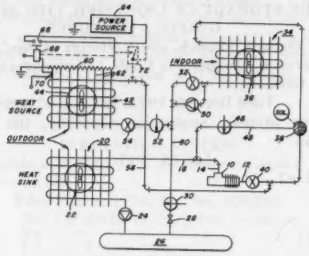
3,918,268

HEAT PUMP WITH FROST-FREE OUTDOOR COIL

Otto J. Nussbaum, Huntsville, Ala., assignor to Halstead Industries, Incorporated, Scottsboro, Ala.

Filed Jan. 23, 1974, Ser. No. 435,673
Int. Cl. F25b *13/00*
U.S. Cl. 62—150 **4 Claims**

1. In a heat pump, the combination of:
an indoor heat exchanger,
first and second outdoor heat exchangers,
a compressor,
a receiver,
conduit means interconnecting said heat exchangers, said receiver and said compressor,
expansion valve means for said indoor heat exchanger and the first of said outdoor heat exchangers,
valve means in the conduit means,
said valve means having a first condition in which the output of the compressor is connected through the second of said outdoor heat exchangers, the receiver, the expansion valve means for the indoor heat exchanger and said indoor heat exchanger back to the input of the compressor whereby the indoor and outdoor heat exchangers act as an evaporator and condenser, respectively,
the valve means having a second condition in which the output of the compressor is connected through said indoor heat exchanger, the expansion valve means for the first outdoor heat exchanger and said first outdoor heat exchanger back to the input of the compressor whereby the indoor and outdoor heat exchangers act as a condenser and an evaporator, respectively,



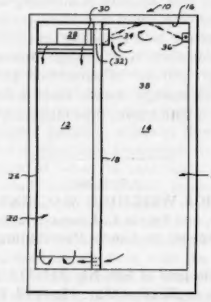
electrical resistance heating means in intimate contact with fins on said first outdoor heat exchanger whereby heat can be transferred from the heating means to the fins by conduction, and
means for energizing said heating means whenever the temperature of the fins reaches a point where frost can form thereon, whereby the fins are maintained free of frost regardless of the ambient temperature.

3,918,269

TEMPERATURE AND AIR FLOW CONTROLLING APPARATUS OF A HOUSEHOLD REFRIGERATOR

Paul E. Summers, and Robert B. Gelbard, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 16, 1974, Ser. No. 515,159
Int. Cl.² F25D *17/00*
U.S. Cl. 62—180 **3 Claims**



1. An improved air-flow system in a side-by-side refrigerator-freezer in which the fresh-food compartment is chilled by circulated air from the refrigeration system being diverted from the freezer compartment, the improvement comprising: means for discharging the diverted chilled air into the fresh-food compartment at a point adjacent the uppermost portion of the compartment's access opening, said discharge means including means for directing the discharged air in a path lying generally in a plane parallel to the plane of the access opening so as to mix with the warmer air extending across the access opening; and

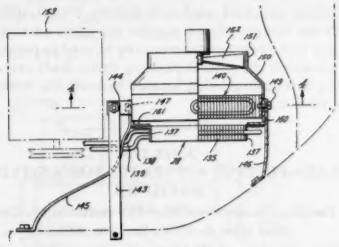
means located in the downstream path of the chilled discharge air for sensing the temperature of the chilled air after mixture with at least some of the warmer air adjacent the access opening of the fresh-food compartment, delivering a signal responsive to said sensed temperature, and controlling the operation of said refrigeration system in response to said signal.

3,918,270

AUTOMOBILE AIR CONDITIONING SYSTEM

Don P. Dixon, and John T. Bertva, both of P.O. Box 18327, Serna Station, San Antonio, Tex. 78286

Filed July 15, 1974, Ser. No. 488,800
Int. Cl.[2] B60H *3/04*
U.S. Cl. 62—239 **4 Claims**



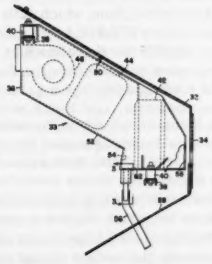
1. In an automobile having a radiator disposed rearwardly of a ventilated grill at the front end of the automobile, and a plenum which extends between the grill and front face of the radiator and has side panels which are connected by bolts to the sides of the radiator; an air conditioning system including a condenser coil, and means including at least certain of said bolts mounting the coil on the front face of the radiator.

3,918,271

ENVIRONMENTAL CONTROL UNIT DRAIN MEANS

Edwin Lee Whisler, Peosta, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 19, 1974, Ser. No. 498,252
Int. Cl.[2] F25D *21/14*
U.S. Cl. 62—285 **3 Claims**



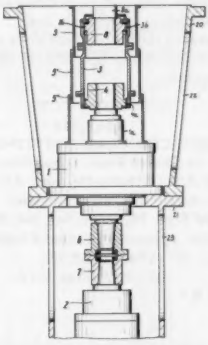
1. In a vehicle cab including an air conditioning system and being of a type including an operators enclosure, an environmental control unit including a housing contiguous with the enclosure and having outlet passage means opening thereinto and having inlet passage means located for allowing outside air to pass into the housing, a blower fan located in the housing for drawing air in said inlet passage means and for forcing air out said outlet passage means, an evaporator means located in the housing between the blower and inlet passage means, a filter located in the housing between the inlet passage means and the evaporator means, a compartment located below said evaporator means for collecting condensation and a drain tube having an upper end connected in fluid communication with the bottom of the compartment and having a lower end positioned exteriorly of the housing at a level below the compartment, the improvement comprising: said drain tube being reversely bent between its upper and lower ends and held in place by a bracket means fixed to the exterior of the housing whereby a column of condensate will accumulate in the drain tube so as to prevent air from being drawn therethrough due to any vacuum condition which might occur in the housing due to the operation of the blower fan and filter.

3,918,272

CENTRIFUGAL PUMP ASSEMBLY FOR USE IN NUCLEAR REACTOR PLANTS OR THE LIKE

Ernst Honold, and Michael Rüpp, both of Frankenthal, Germany, assignors to Klein, Schanzlin Becker Aktiengesellschaft, Frankenthal, Germany

Filed Dec. 12, 1973, Ser. No. 426,629
Claims priority, application Germany, Dec. 16, 1972, 2261643
Int. Cl. F16d *3/06*
U.S. Cl. 64—23 **12 Claims**



1. In a centrifugal pump assembly, particularly in a primary recirculating pump for use in nuclear reactor plants, a combination comprising an upright motor shaft; a pump shaft coaxial with and spaced apart from said motor shaft; a bearings-carrying intermediate shaft coaxial with, disposed between and movable axially relative to said first mentioned shafts between an operative position and an inoperative position; a first coupling provided between said motor shaft and said intermediate shaft; a variable-length shroud normally surrounding said first coupling; and a second coupling provided between said pump shaft and said intermediate shaft, one of said couplings being respectively engaged and disengaged in said operative and inoperative positions of said intermediate shaft.

3,918,273

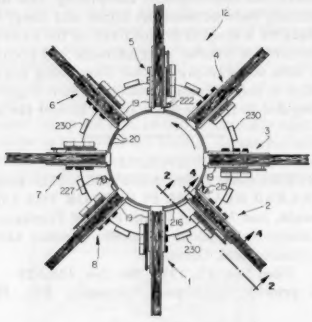
SLIVER FEEDING MEANS FOR HIGH PILE FABRIC KNITTING MACHINES

Thomas J. Thore, Tarboro, N.C., assignor to Glenoit Mills, Inc., New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,744
Int. Cl.[2] D04B *9/14*
U.S. Cl. 66—9 B **8 Claims**

1. A sliver feeding device for a high pile fabric knitting machine having:

a. a main cylinder,
b. plural assemblies of rotatable sliver feed rolls spaced arcuately about the cylinder,
c. drive means for rotating selectively each assembly of feed rolls to deliver sliver to the cylinder,



d. retractable support means for advancing and retracting each assembly of feed rolls to and from sliver feeding position adjacent the cylinder,
e. control means operative to advance and retract the feed roll support means selectively, and
f. actuating means for the feed roll drive means operative to cause each assembly of feed rolls to rotate when in sliver feeding position.

3,918,274

PILE FABRIC CIRCULAR KNITTING MACHINES

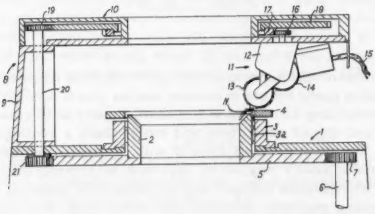
Herbert York, 30 Church Road, Great Glen; Bryan Young, 26 Summerfield Ave., Whitstable, and Alec Wallace, 91 St. John's Road, Swalecliffe, all of England

Filed Sept. 25, 1974, Ser. No. 509,148

Claims priority, application United Kingdom, Nov. 2, 1973, 51057/73; Apr. 11, 1974, 16367/74

Int. Cl.² D04B *9/14*

U.S. Cl. 66—9 B **3 Claims**



1. A multi-feed circular knitting machine for producing high pile fabric comprising a rotary needle cylinder; needles in said cylinder; a stationary cam box which surrounds the cylinder and is fitted with cams for advancing the needles; an annular base plate which supports the cam box; a main gear ring for supporting and driving the needle cylinder; an input shaft having a pinion arranged in mesh with said main gear ring; a plurality of card units provided at card stations around the needle cylinder, each such unit having a driven doffer cylinder the periphery of which is covered with brush-like tines; and means by which loose fibres are fed onto said tines, each card unit being so positioned that the doffer cylinder rotates adjacent to needles advanced at the relevant card stations suchwise as to enable these needles to collect fibres for incorporation in the form of tufts into loops of a knitted ground structure, the improvement in the machine residing in the provision therein, in combination, of a superstructure comprising a plurality of support columns extending vertically upwards from the aforementioned annular base plate and an annular top plate casting of hollow box section located well above and clear of the needle cylinder, the card units being mounted upon and supported by the superstructure at a height above and clear of the annular base plate, the cam box and the needle cylinder; a top gear ring rotatably mounted within said top plate casting; a vertical driven shaft extending upwardly through one of the vertical support columns; a first pinion which is secured to the lower end of said drive shaft and is arranged in mesh with the main gear ring; a second pinion which is secured to the upper end of the same drive shaft and is arranged in mesh with the top gear ring; for each card unit a driving pinion which is housed within the annular top plate casting of hollow section, and is arranged to be driven from the top gear ring; a depending drive shaft which has secured to its upper end said card unit driving pinion and projects through the bottom of said annular top plate casting; and for each card unit a brushing unit casting formed to provide a gear box into which the said depending drive shaft extends, said brushing unit casting being located beneath the hollow annular top plate casting.

3,918,275

YARN-FEEDING APPARATUS FOR KNITTING MACHINES

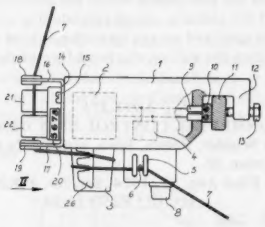
Horst Paepke, Fasanenweg 30, 7407 Rottenburg, Germany

Filed Apr. 5, 1974, Ser. No. 458,288

Claims priority, application Germany, Apr. 14, 1973, 2318966

Int. Cl.² D04B *15/48*

U.S. Cl. 66—132 **16 Claims**



1. In combination with a yarn supplier and a yarn consumer, particularly a knitting machine, which pulls yarn from the yarn supplier, a yarn feeding apparatus for facilitating the travel of yarn from the supplier to the consumer, the yarn feeding apparatus comprising brake means for frictionally engaging and exerting a braking force upon yarn traveling from the supplier to the consumer, said brake means being configurated to snare knots in a yarn being braked by said brake means; and tension stabilizing means for stabilizing yarn tension and counteracting yarn tension increases, comprising rotating conical yarn feed means downstream of said brake means operative for supporting at least one turn of yarn and for exerting upon such turn of yarn a positive pulling force pulling yarn through said brake means when the frictional engagement between the surface of said rotating feed means and such turn of yarn reaches a predetermined value in response to yarn tension increases caused by increases of consumer pull, and knock-off means downstream of said rotating conical member operative for terminating rotation of said conical yarn feeding means in response to yarn breakage, wherein said brake means comprises an inlet yarn guide member and an outlet yarn guide member, a brake adjuster disk rotatable about a predetermined axis, and two spaced friction bodies mounted on said disk eccentric to said axis intermediate said inlet and outlet guide members and operative for guiding yarn from said inlet guide member to said outlet guide

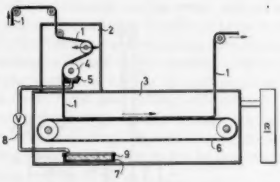
member through the space intermediate said spaced friction bodies and along a meandering path defined by said two spaced friction bodies and by said inlet and outlet guide members, wherein the spacing between said two spaced friction bodies is adjustable, wherein said two spaced friction bodies are of cylindrical configuration, wherein one of said two cylindrical friction bodies is rotatable about an axis eccentric to the symmetry axis thereof, whereby to permit adjustment of the spacing intermediate said two cylindrical friction bodies.

3,918,276

APPARATUS FOR THE WET TREATMENT AND SUBSEQUENT DRYING OF A TEXTILE FABRIC WEB

Kurt Bruckner, 6122 Erbach/Odenwald, Donnerberg, Germany

Filed Apr. 29, 1974, Ser. No. 465,062
Claims priority, application Germany, May 4, 1973, 167701
Int. Cl.² D06B *1/14, 9/06*
U.S. Cl. 68—18 R **4 Claims**



1. In a device for the wet treatment and subsequent drying of a textile fabric web, said device including a treatment chamber wherein a liquid treatment medium which comprises at least one organic solvent is applied to the web from a container as the web is passed through said treatment chamber, a drying chamber located to receive the web from said treatment chamber, means associated with said drying chamber for passing a stream of hot air through the fabric web, and a recovery device adjacent the drying chamber for the recovery of organic solvent removed by said hot air stream; the improvement comprising an evaporation dish in said drying chamber, and a valve controlled discharge pipe connecting said container to said dish for conducting treatment medium for said container to said dish.

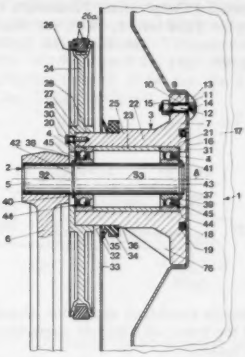
3,918,277

BEARING ASSEMBLY

Lembit Nõkk, Goteborg, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Dec. 7, 1973, Ser. No. 422,979
Claims priority, application Sweden, Nov. 13, 1972, 14678/72
Int. Cl.² D06F *37/30*
U.S. Cl. 68—140 **24 Claims**

1. In apparatus for tumbling material comprising a drum having at least one end wall, a support member, a bearing assembly rotatably mounting the drum relative to the support member and drive means for rotating the drum through the bearing assembly, wherein the improved bearing assembly comprises a first, inner shaft member having means adjacent one end for non-rotatably securing it to the support member, a second outer shaft member circumscribing said first shaft member and radially spaced therefrom to define an annular space between said shaft members, means for non-rotatably securing said second outer shaft member to the end wall of the drum at an end thereof opposite said one end of said first shaft member, means for operatively connecting the opposite end of said second outer shaft member to the drive means and a plurality of rolling elements in the annular space between said shaft members supporting said shaft members for relative rotation whereby actuation of the drive means causes rotation



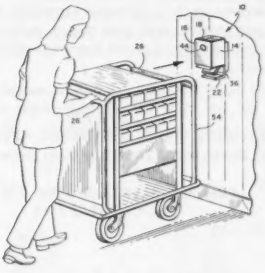
of said outer shaft member relative to said inner shaft member to rotate the drum.

3,918,278

WALL LOCK DEVICE

Harry Warren Spear, Southborough, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed June 17, 1974, Ser. No. 479,664
Int. Cl.² E05B *73/00*
U.S. Cl. 70—58 **7 Claims**

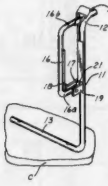


1. A lock comprising a receptable of generally rectangular section having a back, front and side walls, a closed top and an open lower end, bracket means for fastening the back wall to a wall with the open lower end down, a keeper plate extending forwardly from the back wall in spaced parallel relation to the open lower end providing an open ended horizontal space between the open lower end and the keeper plate for accepting a horizontal part of a cart, a rocker pivotally mounted between the side walls within the receptacle with parts extending through the lower end into said space, said rocker comprising a gate and an actuator, said rocker being rotatable to a position to substantially withdraw the gate from the opening and to dispose the actuator in the opening in a position to be engaged by movement of the part into said space and from thence to a position to substantially close the space by pressure of the part against the actuator so as to displace it inwardly relative to the open end of said space, a spring connected to the rocker normally holding the rocker in a position such that the gate is withdrawn from said space and means for holding the rocker in said position with the gate in the closing position.

3,918,279
BICYCLE STAND-LOCK APPARATUS

Donald J. Williamson, Broomfield, Colo., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1973, Ser. No. 403,110
Int. Cl.[2] E05B 71/00
U.S. Cl. 70—234 **13 Claims**



1. Bicycle stand-lock apparatus adapted to surround a portion of the frame of a bicycle comprising:

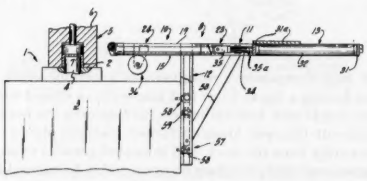
post means,

a locking arm having a free upper end and a lower end pivotally mounted at an intermediate portion of the post means to swing relative to the post means between a depending open position arranged for providing access for a bicycle for the positioning of the frame of the bicycle in a juxtaposed relation to the post means and locking arm and an upstanding closed position wherein the locking arm cooperates with the post means to surround a portion of the frame of the bicycle between the front and the rear wheels thereof, said post means and locking arm having cooperating connector means to provide for the securing of the free upper end of the locking arm at the closed position, said post means having a base section extending from the lower end, said post means having a top section at the upper end extending at right angles to the post means, said post means and top section being made of a length of metal pipe bent at right angles to one another.

3,918,280
MACHINE WORK TRANSFER APPARATUS

Charles R. Davis, Rte. 1 266 River Oaks Drive, Reeseville, Wis. 53579

Filed July 3, 1973, Ser. No. 376,241
Int. Cl.[2] B21J 7/46
U.S. Cl. 72—22 **6 Claims**

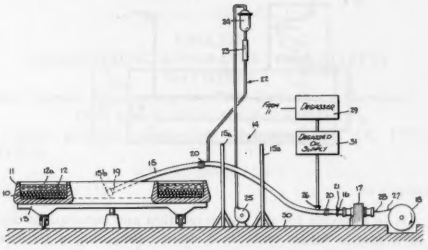


1. An unloading mechanism for a machine having a pair of relatively moving working elements with means for discharging of a work piece normal to movement of the working elements in spaced relation to each other, comprising a flexible member, a support assembly for said flexible member and mounted for movement essentially in a plane normal to the movement of the work elements, said support assembly including a movable leading support means connected to a first inner end of the flexible member and including an outer support means coupled to the opposite outer end of said flexible member and having means establishing a force on said flexible member resiliently urging the movable support means toward the outer support means, means to selectively move the loading support means between a first position spaced from the working elements and a second position with the flexible member between the working elements and carrying the work piece on the flexible member along the direction of movement of the flexible member and over the outer support means to discharge the work piece from the flexible member, and discharge means aligned with the outer support means to receive the work piece.

3,918,281
METHOD FOR SHEATHING A CABLE CORE WITH THE CORE SURROUNDED BY IMPREGNATING FLUID DURING SHEATHING

Paolo Gazzana Priaroggia, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 24, 1974, Ser. No. 517,789
Claims priority, application Italy, Nov. 21, 1973, 31497/73
Int. Cl.[2] B21C 23/30; H01B 13/24
U.S. Cl. 72—38 **5 Claims**



1. A multi-stage process for sheathing an impregnated core having a conductor surrounded by insulation and at least one oil passageway in said core, in which process the core is transferred from a container in which it is immersed in a degassed, water free liquid to an extruder at which the sheath is applied thereto as the sheathed core is then removed from the extruder, said core being surrounded intermediate said container and the point in said extruder at which the sheathed metal is applied to the core by a housing which is fluid-tight except at one of its ends at said container and at its other end at said extruder, said process comprising the following steps:

sealing said housing at its ends;

evacuating the gas from said housing;

filling said housing with a degassed oil under pressure;

opening said one end of said housing and placing it in said liquid in said container to permit said oil to flow from said housing into said container;

at a point on said housing spaced from said container, supplying said oil to said housing to cause it to flow from said last-mentioned point toward said container;

inserting one end of said core into said housing through said opening at said one end and moving said core along the inside of said housing to said other end of said housing;

connecting said end of said core to a source of degassed oil under a pressure higher than the fluid pressure at said one end of said housing; and

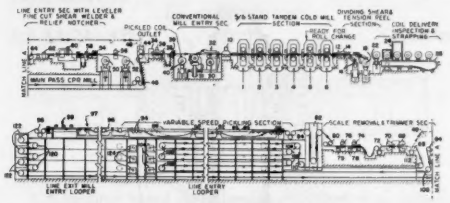
while extruding metal of said sheath on said core, moving said core through said housing in the direction away from said container and maintaining a supply of oil to said point on said housing and to said core to cause said oil to flow along said core during movement thereof and thereby remove gases which may be present in said core.

3,918,282

COMBINATION PICKLING-ROLLING MILL

Werner W. Eibe, Pittsburgh, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Sept. 4, 1974, Ser. No. 503,055
Int. Cl.[2] B21B *45/04*, *45/06*
U.S. Cl. 72—39 21 Claims



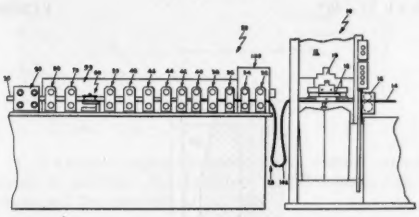
1. A combination pickling-rolling mill comprising a rolling mill section for the rolling of strip, a pickling section for the pickling of strip located on the entry side of said rolling mill section, means including a supply of strip to be pickled and rolled located between said pickling section and the entry end of said rolling mill section for feeding strip to be pickled and rolled from said strip supply to said pickling section in the direction away from said rolling mill section, and means for feeding strip from the exit end of the pickling section in the direction toward said rolling mill section directly to the entry end of said rolling mill section for rolling thereof without the intervening coiling of strip.

3,918,283

TUBULAR ARTICLES AND METHOD OF MAKING SAME

Paul Kosch, Grand Haven, and Paul James Kosch, Spring Lake, both of Mich., assignors to Interstate Products, Inc., Spring Lake, Mich.

Filed Apr. 26, 1974, Ser. No. 464,556
Int. Cl.[2] B21D *39/02*
U.S. Cl. 72—52 23 Claims



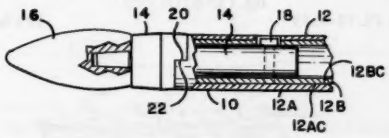
21. A method of manufacturing thin-walled, longitudinally fluted tubing, comprising the steps: shaping a generally flat sheet of stock by forming generally longitudinally-extending fluted deformations therein; rolling said stock through a plurality of successive pairs of mating rollers to thereby incrementally and progressively change the overall cross-sectional shape of said stock from generally flat to generaly circular; closing the circumference of said generally circular cross section and securing the longitudinal edges thereof together to form a tube; rotatably driving selected ones of said rollers during said rolling process including at least certain thereof located where said stock has become generally circular to exert a pulling force on said stock, while leaving other selected rollers undriven including certain thereof located near the beginning of said rolling process where said stock is still generally flat to act as a drag on said stock; and maintaining said fluted deformations in generally unflattened condition throughout the steps following formation thereof, such that the same are still present in the completed tube.

3,918,284

SEAMLESS TUBE MILL PIERCER MANDREL AND ASSEMBLY

Bertrand M. Reiley, Canfield; Edwin J. Muccillo, Youngstown, and Robert G. Griffith, Poland, all of Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Division of Ser. No. 352,928, April 20, 1973, Pat. No. 3,882,595. This application Oct. 29, 1974, Ser. No. 518,363
Int. Cl.[2] B21B *25/00*
U.S. Cl. 72—97 2 Claims



1. A seamless tube mill piercer point mandrel assembly comprising a piercer point and a support mandrel for said piercer point, and wherein the outside diameter of said piercer point is greater than the diameter of said support mandrel, the improvement wherein:

said support mandrel is a composite structure formed by stretch reducing the combination, when at hot working temperature, of a first tube over a second tube,

the tubes of said composite structure being of substantially the same length, and

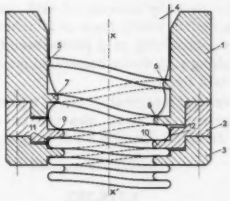
said mandrel having increased resistance to axial applied compressive forces.

3,918,285

METHOD AND APPARATUS FOR FORMING FLEXIBLE CORRUGATED MEMBERS

Joseph Charvet, Bessancourt (Val d'Oise), France, assignor to Societe Francaise de Tuyaux Metalliques/Flexibles, Paris, France

Continuation-in-part of Ser. No. 738,215, June 19, 1968, abandoned. This application Mar. 30, 1971, Ser. No. 129,357
Claims priority, application France, June 21, 1967, 67.111251
Int. Cl.[2] B21D *15/04*
U.S. Cl. 72—77 12 Claims

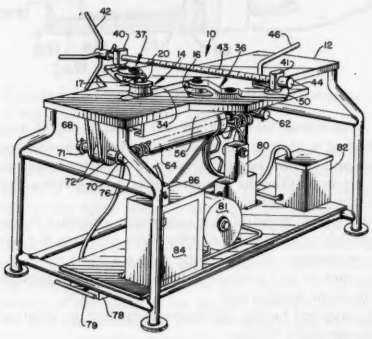


1. A die for providing a tube with a continuous helical corrugation comprising:

at least two rigid non-interrupted continuous portions, each of said portions having a length dimension defining a bore extending therethrough, said portions having their bores aligned coaxially, the first of said portions having its bore machined to form a continuous rigid groove-forming helical thread with convolutions having a constant pitch and an inner diameter which decreases progressively in the direction of the second portion, the second of said portions having its bore machined to form a continuous groove-forming helical thread having a substantially con-

stant inner diameter and a pitch which decreases progressively towards the end of the bore disposed away from said first portion, said helical thread of said second portion forming a continuation of the helical thread of said first portion.

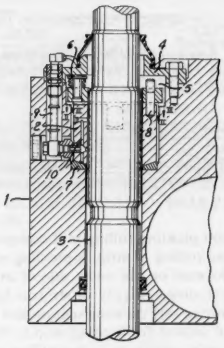
3,918,286
U-BOLT BENDING MACHINE
Willard Whitehead, 212 E. Indiana, Midland, Tex. 79701
Filed Oct. 17, 1975, Ser. No. 515,501
Int. Cl.² B21D *7/03*
U.S. Cl. 72—213 **10 Claims**



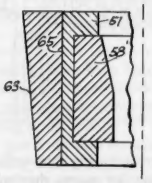
1. In a bending machine for bending metal stock to produce U-bolts and the like, a longitudinally extending table having a longitudinally extending slot formed therein;
an elongated slidable power member underlying said slot, means slidably capturing said power member to said table in a slidable and abutting manner to slidably engage abuting surfaces of said power member and said table;
a mandrel attached to said power member and having a free marginal end portion extending through said slot; a movable die affixed to the marginal free end portion of said mandrel;
spaced fixed dies equally spaced apart and from said movable die;
spaced arms pivotally secured to said table and having a swingable end to which there is attached said fixed die;
means for reciprocating said power member to move said mandrel along said slot to cause said movable die to move between said fixed dies;
so that the central marginal length of a piece of metal stock placed against said fixed dies can be engaged by said movable die and bent into a curved configuration.

3,918,287
ROLLING STAND PRESTRESSING SYSTEM
Bengt-Olof Bjorkman, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden
Filed July 18, 1974, Ser. No. 489,702
Claims priority, application Sweden, July 20, 1973, 101511
Int. Cl.² B21B *31/24*
U.S. Cl. 72—246 **9 Claims**

1. A rolling stand comprising a pair of chocks for rotatably supporting a pair of rolls, means for effecting movement of one of said chocks toward and away from the other of said chocks in order to effect the relative position of said chocks and the rolls carried thereby, prestressing means for applying a prestressing force to one of said chocks urging said one chock away from the other chock, said prestressing means comprising spring means urging one of said chocks away from the other of said chocks, and said spring means including at least one mechanical spring for applying a force to said one of said chocks which is substantially constant and independent of the position of said one of said chocks.



3,918,288
DIE
Miguel A. Verduzco, Chicago, and James W. Dally, Park Forest, both of Ill., assignors to LaSalle Steel Company, Hammond, Ind.
Filed Aug. 10, 1970, Ser. No. 62,255
Int. Cl.² B21C *3/00*
U.S. Cl. 72—467 **1 Claim**

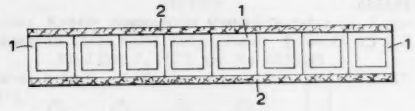


1. A die comprising a casing having axially spaced flanges extending inwardly to define a central opening in the casing, a die nib having an axial dimension greater than the spacing between the flanges of said casing and a diameter greater than the diameter of said central opening positioned in said central opening whereby the die nib is adapted to be received in the central opening when the casing is at an elevated temperature whereby the nib in the central opening is subjected to axial and radial stresses on cooling of the casing, and a ring about the casing having a central recess corresponding to the outer surface of the casing, with the ring being adapted to receive the casing when the ring is at an elevated temperature whereby the ring exerts a radial stress on the die nib on cooling.

3,918,289
HAMMER BOARD

Donald Buchanan Oswald, Compton, and Melvin Douglas, Penkridge, both of England, assignors to D. B. Oswald & Company Limited, Warley, Worcestershire, Great Britain

Filed Sept. 20, 1973, Ser. No. 399,071
Claims priority, application United Kingdom, Sept. 27, 1972, 44521/72
Int. Cl.² B21J 7/06
U.S. Cl. 72—439 4 Claims

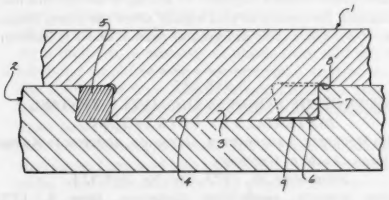


1. A hammer board comprising in combination an elongate metal body having opposed, substantially parallel, flat working faces; said body being formed from a plurality of similar, hollow, elongate aluminum metal members of rectangular cross section extending side-by-side in a surface-to-surface relationship and parallel to the longitudinal axis of said body; each of said working faces being at least partially covered by a strip of facing material having a high co-efficient of friction; said strip being bonded by an adhesive bonding agent to said faces whereby said members are secured together as a unitary member.

3,918,290
HAMMER FORGING DIE

Robert M. Ulichny, Milwaukee, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Oct. 2, 1974, Ser. No. 511,103
Int. Cl.² B21D 37/04
U.S. Cl. 72—481 6 Claims



1. A hammer forging die block having a shank extending across its underside, and comprising a dowel integral with said shank and the underside of said block.

3,918,291
METHOD AND APPARATUS FOR TESTING LEAKAGE RATE

Joachim W. Pauly, Woodland Hills, and Wilbur Stanley Leinberry, Studio City, both of Calif., assignors to Sterer Engineering & Mfg. Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 338,377, March 5, 1973, abandoned. This application May 7, 1974, Ser. No. 467,805
Int. Cl.² G01M 3/26
U.S. Cl. 73—40 21 Claims

1. The method of determining the rate of leakage of air from a submarine in standard units, comprising the steps of:

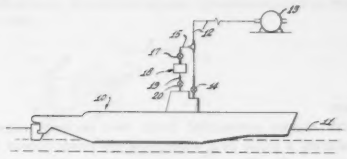
pressurizing the submarine to a selected approximate level and permitting the temperature thereof to become stabilized;

measuring the stabilized pressure level and adjusting it precisely to a selected test level;

introducing an adjustable test flow of air into the submarine and adjusting the rate of the test flow as required to maintain the selected test level until a stabilized flow rate is obtained and said test level is maintained;

accurately measuring the flow rate and the temperature of the test flow;

converting the measured test flow rate at the pressure of said test level to an equivalent flow rate at a standard pressure, by applying a first conversion factor determined



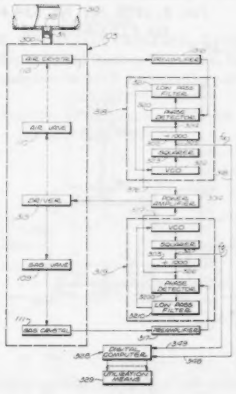
by the difference between the test pressure and the standard pressure;

and converting the equivalent flow rate at the standard pressure and the measured temperature to an equivalent flow rate at the standard pressure and a standard temperature, by applying a second conversion factor determined by the difference between the measured temperature and the standard temperature.

3,918,292
GRAVITOMETER

Albert Donald Stolzy, Encino, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,043
Int. Cl.² G01N 9/00
U.S. Cl. 73—32 A 6 Claims



1. A gravitometer comprising: a thermally conductive block means having first and second cells adapted to contain first and second fluids, respectively; first means to circulate said second fluid through said second cell at a rate such that the pressure in both of said first and second cells is substantially the same, said block means being constructed in a manner such that the temperature of said fluids is substantially the same; first and second structures mounted in said first and second cells, respectively, in a manner to vibrate; second means to vibrate both of said first and second structures in a manner such that they have periods of vibration directly proportional to T_a and T_g, respectively, as a function of the densities of said first and second fluids, respectively, said first and second structures having periods T_{ao} and T_{go}, respectively, when the pressure in both of said cells is a vacuum; first and

second transducers mounted on said block means in a manner to receive a least a portion of the vibrational energy of said first and second structures, respectively, to produce first and second alternating output signals, respectively, having periods directly proportional to T_u and T_v, respectively; third means connected from said first transducer for producing a series of pulses at a pulse repetition frequency directly proportional to f

$$f = \frac{1}{T_u - T_{uo}};$$

where

fourth means connected from said second transducer for producing a pulse of a width directly proportional to w where $w = T_v - T_{vo}$;

and an AND gate having first and second inputs connected from said third means and said fourth means, respectively, and an output, the said input connections of said AND gate being arranged to cause a number of pulses to be produced at said output thereof directly proportional to G, where

$$G = \left[K\right]\left[\frac{T_u - T_{uo}}{T_v - T_{vo}}\right]$$

and where G is the ratio of the density of said second fluid to that of said first fluid, and K is a constant of proportionality.

3,918,293

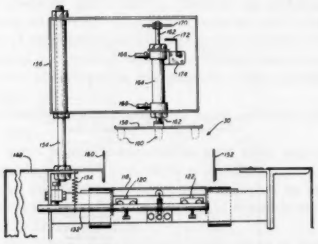
APPARATUS FOR TESTING AND EMPLACING FLEXIBLE SEALED PACKAGES

Harold J. Feigel, Teaneck, N.J., assignor to Neo-Dyne Industries, Inc., Roselle, N.J.

Division of Ser. No. 342,788, March 19, 1973. This application Jan. 8, 1975, Ser. No. 539,463

Int. Cl.² G01M 3/02

U.S. Cl. 73—49.3 **7 Claims**



1. Apparatus for testing the sealing state of flexible packages, including sealed-in gas, comprising in combination:

a support surface for holding said package to be tested;

a testing platen moveable toward said surface and said package;

means to advance said platen against said package;

means to stop said advancement of said platen at a predetermined resistive force caused by the resultant compression of said gas in said package;

means establishing a limit point in the said path of advancement of said platen; and

means to indicate resultant displacement of said platen beyond said limit point, said limit point being established beyond that point which said platen would reach in the presence of a resistive force arising from compression of gas in satisfactorily sealed package whereby said displacement beyond said limit point indicates a leak at said package.

3,918,294

AXIAL FORCE MEASURING METHOD UTILIZING ULTRASONIC WAVE

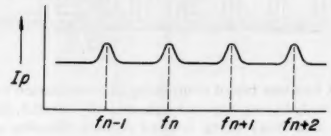
Takayuki Makino, Okazaki, and Haruhiko Toriyama, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 196,896, Nov. 9, 1971, Pat. No. 3,822,587. This application Mar. 29, 1974, Ser. No. 456,285

Claims priority, application Japan, Nov. 24, 1970, 45-103555

Int. Cl.² G01H 13/00; G01L 5/12

U.S. Cl. 73—67.2 **2 Claims**



1. A method of obtaining a measure of an axial force within an article under strain from a variation of natural frequencies of said article, comprising the steps of: applying an ultrasonic wave to said article to generate forced oscillations therein; measuring a first natural frequency of said article when said axial force within said article is substantially zero; measuring a second natural frequency of said article when said article is under strain and said axial force is greater than zero; determining differential ($f\epsilon_2 - f\epsilon_1$) between said first and second natural frequencies; and comparing thus determined differential with calibration data which has been obtained with respect to axial force versus differential to locate the existing axial force; the frequency of said ultrasonic wave being selected to satisfy the equation

$$(f\epsilon_2 - f\epsilon_1)/f\epsilon_1 = K[\{(1-\nu\epsilon_2)\sqrt{1+\epsilon_1}/(1-\nu\epsilon_1)\sqrt{1+\epsilon_2}\}-1],$$

where $f\epsilon_1$ is the first measured natural frequency of said article when the strain thereof is ϵ_1 (ϵ_1 0), $f\epsilon_2$ is the second measured natural frequency of said article when the strain thereof is ϵ_2 ($\epsilon_2 > 0$), K is a constant greater than 3, and ν is Poisson's ratio.

3,918,295

METHOD OF NONDESTRUCTIVELY TESTING MATERIALS BY ULTRASOUND

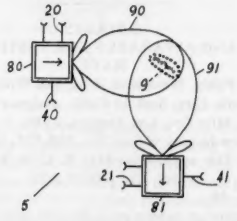
Joachim Herbertz, Laurensberg, Germany, assignor to Raimar Pohlman, Aachen, Germany

Filed May 30, 1973, Ser. No. 365,324

Claims priority, application Germany, June 5, 1972, 2227259

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.7 **9 Claims**



1. A method of nondestructively testing materials by a transmitter and a receiver of ultrasound, wherein the transmitter and receiver each have characteristic directional lobes during operation thereof, said method comprising the steps of: a. continuously supplying a non-contact-making transmitter with electrical high frequency power at a suitable frequency for generating ultrasound waves;

b. amplitude-modulating the generated ultrasound waves with a low frequency produced by the creation of a low-frequency magnetic field, and

c. separating the received acoustical signals from internal noise or external interference by detection of the amplitude-modulation.

3,918,296

PULSE REFLECTION TYPE ULTRASONIC THICKNESS METER

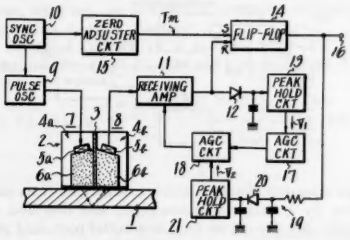
Toyohiko Kitada, Sagamihara, Japan, assignor to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 403,098

Claims priority, application Japan, Oct. 10, 1972, 47-101351

Int. Cl.² G01B 17/02

U.S. Cl. 73—67.7 **3 Claims**



1. A pulse reflection type ultrasonic thickness meter comprising:

a pulse oscillator means for producing a transmission signal;

an ultrasonic transducer connected to said pulse oscillator means, producing an ultrasonic pulse wave, said ultrasonic pulse wave being transmitted to an object to be measured, and said transducer receiving an echo pulse train including a plurality of pulses from said object;

a receiving amplifier with a variable gain control receiving the echo pulse train output of said ultrasonic transducer to control the height of a first echo pulse included in said echo pulse train;

a pulse generator means connected to receive said transmission signal from said pulse oscillator means and said echo pulse train from said receiving amplifier and producing a pulse signal whose duration is proportional to the thickness of said object; and

an automatic gain control means connected to the variable gain control of said receiving amplifier and receiving a first input from said pulse generator means and a second input from said receiving amplifier and having two output conditions which depend upon which of its two inputs are smaller and such that the smaller of its two inputs control its output condition for controlling the gain of said receiving amplifier.

3,918,297

ACOUSTIC IMAGING APPARATUS WITH GRAY SCALE DISPLAY

Henry A. F. Rocha, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1974, Ser. No. 511,616

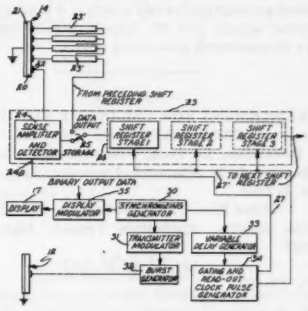
Int. Cl.² G01N 29/04

U.S. Cl. 73—67.7 **10 Claims**

1. Acoustic imaging apparatus with a gray scale display comprising

means for periodically generating a series of acoustic pulses that are directed toward an object and reflected by an acoustic heterogeneity in a planar object region to produce a train of acoustic echoes of varying intensity depending on the reflectivity of the heterogeneity and the amplitude of the acoustic pulse,

acoustic image converter means and gating means therefor comprising an array of transducers and signal processing channels for individually sensing the acoustic echoes and periodically producing and reading out binary output data for the array representing the amplitudes of the sensed echoes above and below a predetermined comparator level,



means for varying the amplitude of said acoustic pulses and in respectively converse manner varying the amplitude of said periodically read out binary output data to effectively change the sensitivity of the apparatus, and

visual display means for periodically displaying said variable amplitude output data to produce images having a brightness indicative of the reflectivity of the heterogeneity.

3,918,298

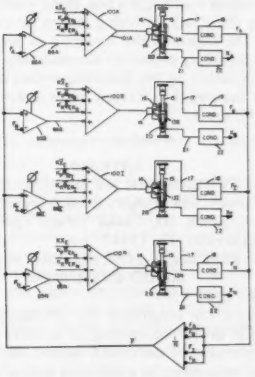
MULTIPLE ACTUATOR CONTROL SYSTEM

Niel R. Petersen, Hopkins, and Rodney L. Larson, Minnetonka, both of Minn., assignors to MTS Systems Corporation, Minneapolis, Minn.

Filed July 29, 1974, Ser. No. 492,448

Int. Cl.² G01N 29/00

U.S. Cl. 73—71.6 **11 Claims**



1. A test apparatus comprising a plurality of displacement generating devices for displacing a rigid structure constrained for movement in a vibratory path, first means for supplying to the displacement generating devices a time varying first command signal representative of a desired average displacement in relation to time of said structure to be produced by said displacement generating devices, second means coupled to

the displacement generating devices for providing a second signal representative of the actual average displacement of said structure, third means coupled to said displacement generating devices for providing a separate third signal for each of said displacement generating devices representative of difference in the force applied to the structure by each respective displacement generating device and a function of the average force actually exerted by said displacement generating devices and applied to said structure, and fourth means to provide a separate control signal to control each of said displacement generating devices which is a function of the first and second signals, and the respective third signal for a respective displacement generating device.

3,918,299

ARRANGEMENT FOR USE IN THE STUDY OF THE PROPAGATION OF CRACKS

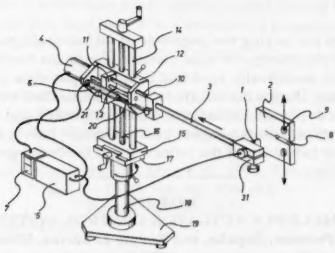
Henri Donnadieu, Le Pecq, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Mar. 21, 1974, Ser. No. 453,355

Claims priority, application France, Mar. 23, 1973, 73.10605

Int. Cl. G01n *3/32*

U.S. Cl. 73—91 **30 Claims**



1. An arrangement for use in the study of the propagation of cracks, comprising, in combination, crack-detecting means operative for examining a limited portion of an object to determine whether such portion is cracked; control means automatically operative in response to determination by said detecting means that the portion being examined is cracked for causing the crack-detecting means to examine the next portion of the object in the direction of propagation of the crack; and recording means for automatically making a record of the examination by the detecting means of the successive portions of the object to thereby make a record of the propagation of the crack.

3,918,300

HEAT TRANSFER MEASURING DEVICE

Aaron Weisstuch, 326 Margery Road, Yardley, Pa. 19067, and Charles E. Schell, III, Chalet Village Apartments, Heights Lane, Feasterville, Pa. 19047

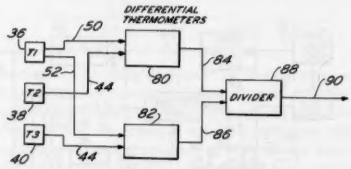
Filed Jan. 3, 1974, Ser. No. 430,453

Int. Cl.² G01M *19/00*

U.S. Cl. 73—112 **11 Claims**

1. A device for measuring the efficiency of a heat exchanger, said device comprising a plurality of temperature sensors, a plurality of difference means, each of said difference means responsive to a different pair of said sensors for providing a signal representative of the temperature difference between the locations of said sensors, calculation means responsive to said signals from said difference means for generating a signal representative of the efficiency of said heat exchanger, said exchanger having one fluid which is in a closed chamber and a second fluid which flows through a second chamber having an inlet and outlet port and which is separated by a heat conductive wall from said closed chamber, said plurality of temperature sensors being disposed at said inlet and outlet ports of said second chamber and within said closed chamber, a first of said difference means being responsive to said sensors at said inlet port and in said closed chamber, the second of said difference means being responsive to sensors at said outlet port and in said closed chamber.

5. A device for measuring the efficiency of a heat exchanger, said device comprising a plurality of temperature sensors, a plurality of difference means, each of said difference means responsive to a different pair of said sensors for providing a signal representative of the temperature difference between the locations of said sensors, calculation means responsive to said signals from said difference means for generating a signal representative of the efficiency of said heat exchanger, said heat exchanger having one fluid which flows through a first chamber and a second fluid which flows



through a second chamber which is separated from said first chamber by a heat conductive wall, said first and second chambers each having an inlet and outlet port, said plurality of temperature sensors being disposed at each of said inlet ports and each of said outlet ports of said heat exchanger, a first of said difference means being responsive to said sensors at said outlet and inlet ports of said first chamber, a second of said difference means being responsive to said sensors in said inlet ports in said first and second chambers and a third of said difference means being responsive to said sensors in said outlet port of said first and second chambers, said calculation means including an adder which receives the output signals of said second and third difference means and a divider which receives the output of said adder and said first of said difference means, the output of said divider representing the heat transfer coefficient of the heat exchanger.

3,918,301

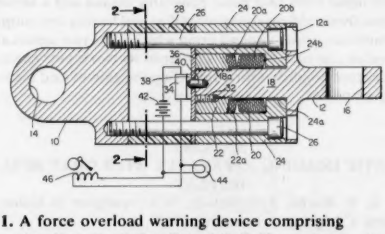
FORCE OVERLOAD WARNING DEVICE

John S. Baer, Schooner Head, Bar Harbor, Maine 04609

Filed Apr. 24, 1974, Ser. No. 463,517

Int. Cl.² G01L *1/04*

U.S. Cl. 73—141 A **16 Claims**



1. A force overload warning device comprising

a plurality of axially aligned Bellville washers, of similar shape in a stack, the washers in the stack being dividable into two oppositely oriented arrays, whereby edges of adjacent washers in the opposed arrays are in contact with one another and define between them a wedge-shaped annular space,

means to prevent the washers from moving laterally,

opposed compression means arranged to apply opposed forces tending to compress and Bellville washers, the

compression means at one end of the stack presenting a surface conforming to the shape of the washers, and the compression means at the opposite end presenting a non-conforming surface against which the adjacent washer can flatten, provided that at least one washer is opposed to the conforming surface, and

detection and indicator means to detect when a predetermined amount of movement between said compression means has occurred upon experiencing a predetermined force dependent upon the number of washers in the array that are subject to flattening by the compressive force and to indicate when such force has been reached or exceeded.

3,918,302

ROLLING MILL TEST EQUIPMENT

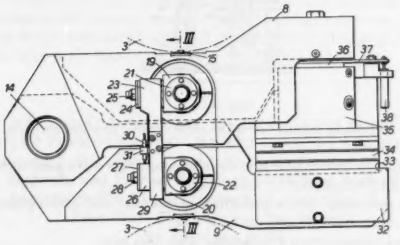
Charles Roger Skelton; Joseph William Marshall, both of Sheffield; Roy Ronald Oxlade, London, and Keith Cyril Gibson, Kingston, all of England, assignors to British Steel Corporation, London, England

Filed Aug. 29, 1974, Ser. No. 501,614

Claims priority, application United Kingdom, Sept. 7, 1973, 44240/73

Int. Cl.² G01L *5/00*

U.S. Cl. 73—141 R **19 Claims**



16. Apparatus for testing the characteristics of a rolling mill stand which in use has two work rolls, said apparatus including an elongate member adapted to be passed between the work rolls of the rolling mill stand, mounting means connected with one end of the member and adapted to be held to the frame of the stand, means for applying a longitudinally directed tensile load to said elongate member, means for measuring said applied load, and means rigidly connected to the other end of said elongate member for reacting said applied load against said work rolls.

3,918,303

CALORIMETER

Romen Abdullaevich Zakhidov, Preobrazhenskaya ulitsa, 5/7, kv. 22, and Dmitry Ivanovich Teplyakov, Molodezhnaya ulitsa, 4, kv. 256, both of Moscow, U.S.S.R.

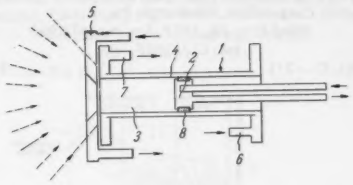
Continuation of Ser. No. 87,312, Nov. 5, 1970, which is a continuation of Ser. No. 696,564, Jan. 9, 1968, abandoned.

This application July 3, 1972, Ser. No. 268,756

Int. Cl. G01k *17/00*

U.S. Cl. 73—190 R **2 Claims**

1. In a calorimeter for measuring radiant flux density: a cylindrical shell having an inner surface; a slidable piston in said shell constituting a bottom therefor, said inner surface and piston being substantially totally heat absorbent; means insulating the shell and piston against heat transfer therebetween; means to pass radiant flux into the shell for absorption by the inner wall thereof while protecting the outer wall thereof against the incidence of radiant flux; a cooling system for said shell to absorb heat received by the shell by the radiant flux; a separate cooling system for said piston; and temperature sensing means connected to the cooling system for the



shell to measure change in temperature thereof due to heat absorption from the shell.

3,918,304

FLOWMETER COMPUTER

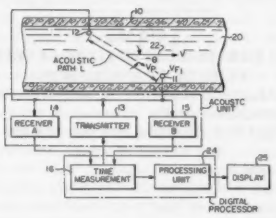
Joseph Abruzzo, Severna Park; Frederick J. Lori, Crofton; Theodore W. Synowka, Glen Burnie; Lawrence G. Wright, Pasadena, and William H. Foertsch, Linthicum Heights, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 418,636, Nov. 23, 1973, abandoned.

This application July 9, 1974, Ser. No. 486,929

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **5 Claims**



1. A system for measuring the flow rate of a liquid comprising in combination:

a. first and second transducers; means for energizing said first and second transducers to inject first and second acoustic signals into said liquid;

b. means for detecting and for producing first and second elapsed time signals related to the flow rate of said liquid in response to said acoustic signals; and

c. programmable digital processor means utilizing said first and second elapsed time signals to calculate the flow rate of said liquid by solving the following equation,

$$Q_n = \frac{K(T_2 - T_1)}{T_1 T_2}$$

wherein the terms are defined as;

Q_n = the flow rate of said liquid

K = is a constant

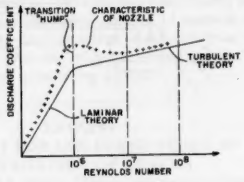
T_1 = is the first elapsed time signal

T_2 = is the second elapsed time signal.

3,918,305
FLOW NOZZLE FOR FLOW MEASUREMENT OF AN INCOMPRESSIBLE FLUID

Robert P. Benedict, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1974, Ser. No. 473,963
Int. Cl.² G01F 1/42
U.S. Cl. 73—211 **4 Claims**

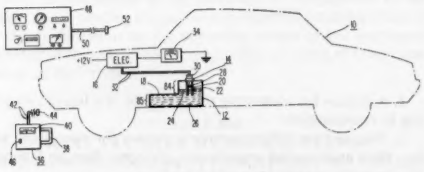


1. A flow nozzle for measuring fluid flow rate of an incompressible fluid in a closed channel, said nozzle comprising:
a converging portion,
a cylindrical throat portion adjacent said converging portion,
turbulence promoting means for converting a laminar boundary layer within said incompressible fluid while said fluid flows within said nozzle to a turbulent boundary layer within said incompressible fluid while said fluid flows within said nozzle, said turbulence promoting means being disposed at a predetermined location on said converging portion,
a first pressure tap located upstream of said converging portion, and,
a second pressure tap disposed downstream of and spaced away from said converging portion.

3,918,306
SYSTEM FOR MEASURING FLUID LEVELS IN A VEHICLE TRANSMISSION

Frederick L. Maltby, Jenkintown, Pa., assignor to Drexelbrook Controls, Inc., Glenside, Pa.

Filed Mar. 15, 1974, Ser. No. 451,407
Int. Cl.² G01F 23/26
U.S. Cl. 73—304 C **15 Claims**

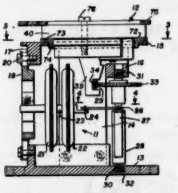


1. A system for measuring automobile transmission fluid levels comprising:
an automobile transmission including a transmission housing enclosing a transmission fluid;
a pair of probe electrodes attached to said housing, said electrodes extending into said transmission fluid through the uppermost surface thereof such that the amount of fluid between said electrodes varies with the level of said transmission fluid in said housing;
circuit means coupled to said pair of probe electrodes so as to form an impedance network including the capacitance between said probe electrodes which varies as a function of the transmission fluid level; and
detector means coupled to said circuit means for generating an output signal representing the change in the impedance network of said circuit means;
said circuit means including a temperature-sensitive impedance means attached to said housing so as to be in thermal communication with the transmission fluid therein, said temperature-sensitive impedance varying with temperature as the ratio of transmission fluid volume to the area of said uppermost surface, said temperature-sensitive impedance compensating for changes in level due to temperature changes such that said output signal from said detector means represents the level which the transmission fluid within said housing would attain at a fixed reference temperature.

3,918,307
ENCODER FOR ALTIMETERS AND THE LIKE INSTRUMENTS

Robert M. Hulle, Calabasas; John Ferrero, Chatsworth, and Gerard Pannullo, Canoga Park, all of Calif., assignors to Trans-Can Industries, Inc., Van Nuys, Calif.

Filed Aug. 5, 1974, Ser. No. 494,778
Int. Cl.² G01L 7/14
U.S. Cl. 73—387 **12 Claims**



1. Encoding means for altimeters or the like comprising
a frame,
a fluid pressure actuated device including a drive gear rotatably supported by said frame;
an encoding device including an encoder disc and a pinion connected to said encoder disc;
said pinion being engageable with said gear,
a support for said encoding device,
means on said frame forming a bearing,
an adjusting member supported by said bearing for rotational adjustment about the axis of said bearing,
said adjusting member supporting said support with the axis of said pinion eccentric to the axis of said bearing whereby said adjustment of said adjusting member will adjust said pinion relative to said gear, and
means for sensing the position of said encoder disc relative to said support.

3,918,308
LIQUID TRANSFER PIPETTING DEVICE WITH A TIP EJECTOR

Richard D. Reed, San Jose, Calif., assignor to Oxford Laboratories Inc., Foster City, Calif.

Filed May 30, 1973, Ser. No. 365,209
Claims priority, application Germany, Apr. 16, 1973, 2319175
Int. Cl.² B01L 3/02
U.S. Cl. 73—425.6 **7 Claims**

1. In a liquid transfer pipetting device that includes a hollow barrel shaped handle member, a piston chamber within said barrel, said piston chamber having first and second ends, a piston element in said piston chamber that extends through said first piston chamber end, means extending through one end of said barrel member for imparting reciprocal motion to said piston element, resilient means within said barrel for normally urging said piston element to a rest position toward said first end of said piston chamber, and means extending from an opposite end of said barrel for engaging a hollow detachable tip and for providing fluid communication be-

tween said second end of said piston chamber and an internal portion of said tip, the improvement comprising mechanical means associated with said tip holding means and responsive to manual actuation for disengaging a detachable tip from said

tip holding means, said tip disengaging means includes a pair of cooperating cam lobes held in a manner that rotation of an actuator with respect to said handle member causes an ejecting means associated with said detachable tip engaging means to force a tip therefrom upon rotation of the actuator.

3,918,309

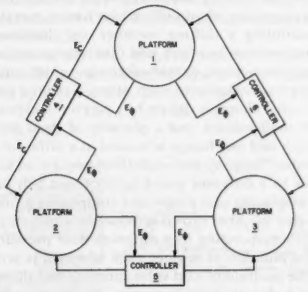
REDUNDANT INERTIAL MEASUREMENT SYSTEM WITH IMPROVED FAILURE-DETECTION CAPABILITY

Bernard J. O'Connor, Eastchester, N.Y.; Richard Shaw, Jr., Mahwah, and Michael Epstein, New Milford, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 31, 1972, Ser. No. 240,082

Int. Cl. G01c *19/00*

U.S. Cl. 74—5.34 **16 Claims**



1. A redundant inertial measuring system, comprising:

at least two platforms;

each platform supporting at least three gyros for stabilizing the platform;

the gyros being oriented by disposing the gyro axes substantially normal to the pairs of parallel faces of a regular icosahedron for maximizing the scale triple products of unit vector triads;

means for providing signals corresponding to angular misalignment between the platforms; and

means connected to the last mentioned means and to selected gyros for controlling said gyros in response to the misalignment signals.

3,918,310

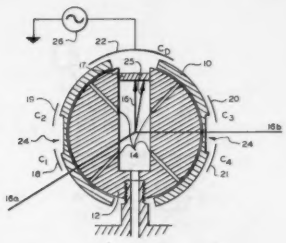
CAPACITIVE SENSING SYSTEM

John L. Evans, Oakland; Lincoln S. Ferriss, Madison, and Jay Hoffmann, Livingston, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed June 14, 1974, Ser. No. 479,465

Int. Cl.² G01C *19/28*

U.S. Cl. 74—5.6 D **6 Claims**



1. A gyroscope construction comprising

a. a stator;

b. a rotor supported for rotation about an axis with respect to said stator;

c. at least two pairs of electrically conducting plates and fixedly positioned with respect to said stator and each having a continuous face, a portion of which is spaced a predetermined distance from and concentric with an electrically conducting portion of said rotor, said plates and said conducting portion forming individual capacitors having a capacitance variable in accordance with the area of said face which is spaced said predetermined distance from said conducting portion of said rotor;

d. a first of said two pairs of plates being positioned on diametrically opposite sides of said rotor and so positioned with respect to said conducting portion that relative angular displacement of said stator and rotor in a first direction about an axis perpendicular to said rotational axis increases said face area of both plates of said first pair by an equal amount, and relative angular displacement about said perpendicular axis in a second direction decreases said face area of both plates of said first pair by an equal amount;

e. a second of said two pairs of plates being positioned on the same opposite sides of said rotor as respective plates of said first pair and so positioned with respect to said conducting portion that relative angular displacement of said stator and rotor about said perpendicular axis in said first direction decreases said face area of both plates of said second pair by an equal amount, and relative annular displacement about said perpendicular axis in said second direction increases said face area of both plates of said second pair by an equal amount;

f. first and second operational amplifiers respectively connected to said first and second pairs of plates to add in parallel the individual capacitance of each pair formed thereby;

g. a differential amplifier connected to both of said operational amplifiers to subtract the output of one from the other;

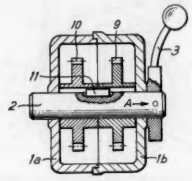
h. an additional plate having a continuous face concentric with and spaced a predetermined distance from an electrically conduction portion of said rotor;

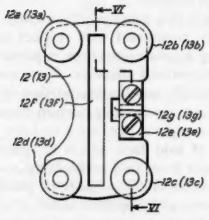
i. an oscillator connected to said additional plate thereby coupling the oscillator's signals to each of said individual capacitors whereby the signal output of said differential amplifier will be commensurate with the amount of said relative annular displacement.

3,918,311
SINGLE-LEVER CONTROL MECHANISM

Konrad Maier, Walldorf, Germany, assignor to Gesellschaft fur Steuerungstechnik mbH & Co.

Filed July 2, 1974, Ser. No. 485,238
Claims priority, application Germany, July 3, 1973, 2333744
Int. Cl.² F16H 19/06
U.S. Cl. 74—37 6 Claims





1. A single lever control mechanism for simultaneously controlling a plurality of operations of a machine in a pre-established relation to one another, the mechanism comprising:

a. a housing;

b. a shaft rotatably supported in said housing and extending therefrom at least on one side;

c. an actuation lever mounted on said shaft outside of said housing for rotating said shaft in a clockwise and counter-clockwise direction;

d. a plurality of sprocket wheels secured to said shaft for rotation therewith;

e. a plurality of endless sprocket chains, each chain being supported by one of said sprocket wheels, a plurality of pulleys mounted on the housing walls at different locations and each of said chains being guided around one of said pulleys, one sprocket engaging roller of each chain being provided with a sliding block;

f. a plurality of slides corresponding in number to the number of wheels and chains, each slide being provided with a slot for engagement by the sliding block of one chain;

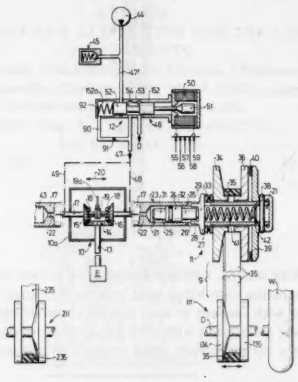
g. guide means for guiding the slides in a direction perpendicular to the axis of the shaft; and

h. power transmitting elements connected to the slides, each one of said chains defining a path of travel around said respective pulleys mounted at different locations on the housing walls, said path of travel and the shape of said slot in each slide displacing each said slide in a different manner relative to all the other slides upon rotation of said actuation lever.

3,918,312
HYDRAULICALLY OPERATED TRANSMISSION SYSTEM FOR AUTOMOTIVE VEHICLES

Helmut Espenschied, Ludwigsburg; Georg Rothfuss, Ditzinger, and Hans-Dietrich Smentek, Vaihingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 7, 1974, Ser. No. 477,477
Claims priority, application Germany, June 8, 1973, 2329364
Int. Cl.² F16H 55/52
U.S. Cl. 74—230.17 F 11 Claims



1. In a transmission system for automotive vehicles or the like, a combination comprising a driven output shaft; a belt drive having a plurality of speed ratios and including two variable-pitch sheaves and an endless flexible element trained over said sheaves, one of said sheaves including two flanges axially movably and rotatably mounted on said output shaft, one of said flanges being movable axially of the other of said flanges; a clutch element mounted on and driven by said output shaft, said clutch element being adjacent to said other flange; means for moving said flanges with and relative to each other and comprising a hydraulic motor having a reciprocable piston constituting a shifting member and displaceable between a first position in which said other flange is disengaged from said clutch element so that said output shaft and said one sheave can rotate relative to each other, a second position in which said other flange is driven by said clutch element when said output shaft rotates, and a plurality of third positions in each of which said one flange is located at a different distance from said other flange so that each third position of said piston corresponds to a different speed ratio of said belt drive; and means for displacing said piston and comprising a single valve having a valve member movable between a plurality of positions each corresponding to a different fluid pressure in said motor and a plurality of devices each of which is arranged to influence the position of said valve member and therewith the pressure of hydraulic fluid in said motor to thus change the position of said piston.

3,918,313
DRIVE MECHANISM

James G. Montagnino, Monroe, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed July 19, 1974, Ser. No. 490,196
Int. Cl.² F16H 35/02
U.S. Cl. 74—393 1 Claim

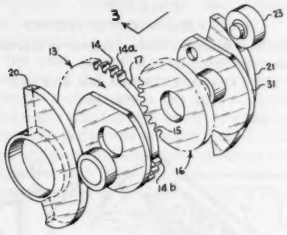
1. In a transmission drive mechanism for operatively coupling an input shaft to an output shaft and wherein one revolution of said input shaft is adapted to impart to said output shaft one revolution of movement having three phases including a first acceleration phase, a second substantially uniform speed

phase and finally a deceleration phase; said mechanism having a mutilated gear mounted on said input shaft;

a full gear mounted on said output shaft and being adapted to mesh with the teeth of said mutilated gear;

a pair of conjugate cams rotatably secured to said output shaft;

a pair of cam followers carried by said output shaft and being adapted to respectively cooperate with said cams during only a portion of the said one revolution of said input shaft; said cams and followers when so mutually cooperating serving to develop said acceleration and deceleration phases: the improvement comprising



said cam followers being constructed of a slightly resilient plastic material and arranged with respect to said cams such that during said portion of said one revolution of said input shaft a structural interference fit exists between said conjugate cams and said cam followers respectively whereby those portions of said shafts respectively disposed between said cams and between said followers are effectively held under opposed torsional stress by said cams and followers during said acceleration and deceleration phases so as to eliminate any operational backlash between said shafts during said acceleration and deceleration phases of the motion of said output shaft.

3,918,314

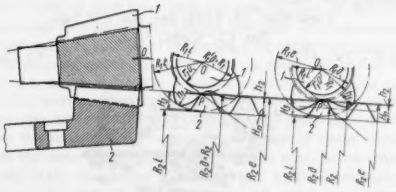
BEVEL GEAR DRIVE WITH CIRCLE-ARC TEETH

Armen Vartanovich Osipyan, Onezhskaya ulitsa, 20, kv. 11, Moscow, U.S.S.R.

Continuation of Ser. No. 414,278, Nov. 9, 1973, which is a continuation of Ser. No. 230,590, March 1, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,701

Int. Cl.² F16H *55/04*

U.S. Cl. 74—459.5 **2 Claims**



1. A bevel gear drive provided with circle-arc teeth comprising a pinion having an axis and a mating gear the improvement being that the face of the contacting tooth of the mating gear is located at such a distance from the pinion axis along the center-to-center line of a reference spur gear drive which exceeds the radius of the pinion pitch circle by up to **0.5** m_s at $\xi_1 + \xi_2 > 0$ and up to **0.1** m_s at $\xi_1 + \xi_2 = 0$ where m_s = face module; ξ_1 and ξ_2 = shift coefficients of cutter tool; in the case of an equal-shift correction the relation of addenda of the contacting teeth is $h_1/h_2 = -13$ to -76 while in the case of an unequal-shift correction $h_1/h_2 = 1.30 - 6.0$ where h_1 = pinion addendum and h_2 = gear addendum

3,918,315

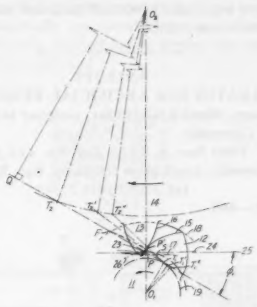
HIGH CAPACITY GEARING

William S. Rouverol, 22 Lovell Ave., Mill Valley, Calif. 94941

Filed July 22, 1974, Ser. No. 490,761

Int. Cl.² F16H *55/06*

U.S. Cl. 74—462 **20 Claims**



1. In a pair of mating gears comprising a larger gear and a smaller gear,

teeth formed on said gears to be in contact at a point between the pitch line and the axis of said larger gear,

the centers of curvature of the profile curves of said teeth at said point being substantially removed from said pitch line.

3,918,316

GEAR SHIFT ARRANGEMENT

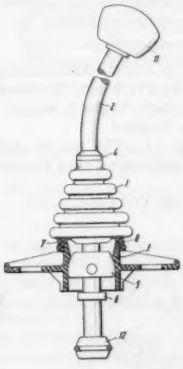
Norbert Reinhold, and Horst Berg, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 17, 1974, Ser. No. 461,488

Claims priority, application Germany, May 29, 1974, 2327283

Int. Cl.² B60K *20/00*

U.S. Cl. 74—473 P **9 Claims**



1. A gear shift arrangement, comprising

a shift lever;

a pivot ball on said shift lever;

a mounting block having a passage into which said shift lever extends and within which said pivot ball is received, said passage being formed with a seat for said pivot ball;

a first abutment on said mounting block and a second

abutment on said shift lever axially spaced from said first abutment; and

elastically compressible annular sealing means surrounding a portion of said shift lever in axially compressed condition and having axially spaced ends which respectively bear upon said first and second abutments, so that said sealing means seals said passage in said mounting block and also urges said pivot ball and said seat into engagement with one another.

3,918,317

APPARATUS FOR ARTIFICIAL RESPIRATION

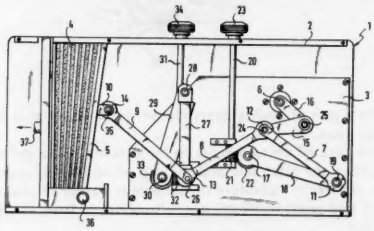
Uwe Claussen, Munich, Germany, assignor to Georg Kinzler, Munich, Germany

Filed Nov. 6, 1973, Ser. No. 413,347

Claims priority, application Germany, Nov. 8, 1972, 2254634

Int. Cl.[2] F16H 21/42

U.S. Cl. 74—469 17 Claims



1. Apparatus for artificial respiration comprising a rigid frame, a breathing air delivery apparatus having a movable part, a drive, an adjustable and flexible power transmission system interconnecting and arranged for intermittently driving said movable part from said drive, said transmission system including a fourpart linkage having plural joints with parallel pivot axes, said linkage incorporating a first said joint which is rigidly mounted, but adjustable and lockable, relative to the frame, a second said joint engaged by the drive and freely movable thereby, a guide mechanism having a defined path of movement, but being adjustable and lockable, relative to the frame and third and fourth said joints guided on the guide mechanism, the interconnection of said transmission system to said movable part including said fourth joint.

3,918,318

ACTUATOR MECHANISM

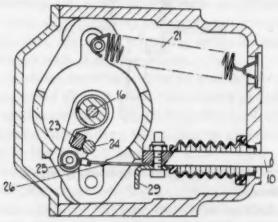
Ronald Phillips, Northolt, England, assignor to C.A.V. Limited, Birmingham, England

Filed Apr. 11, 1974, Ser. No. 459,969

Claims priority, application United Kingdom, Apr. 1, 1974, 18094/74

Int. Cl.[2] G05G 11/00

U.S. Cl. 74—479 9 Claims



1. An actuator mechanism for the fuel quantity control member of a fuel injection pump, the mechanism comprising an electro-magnetic device having a radial arm extending from the device and being angularly movable about an axis proximal to one end of the device, a link pivotally connected proximal to the extended end of the arm, the link containing means for being rigidly mounted upon the control member of a fuel injection pump, and the link being flexible to permit variation in the paths of movement of the ends of the link so that when the link is connected to the control member of a fuel injection pump and the electro-magnetic device is activated for angular movement along with the radial arm connected thereto, the link will suitably flex and shift the control member in the desired manner.

3,918,319

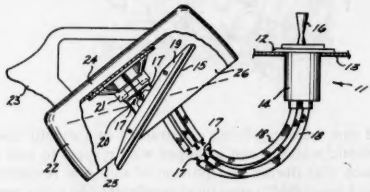
CROSS ARM MIRROR MOUNT

John E. Mills, Strongesville, Ohio, assignor to Harman International Industries, Inc., Detroit, Mich.

Filed Oct. 3, 1973, Ser. No. 403,192

Int. Cl.[2] G05G 1/00

U.S. Cl. 74—491 7 Claims



1. An open faced compression mounting for remotely controlled rearview mirrors and the like comprising:

an elongate trough provided in a mirror back;

a cross member comprising a pair of cylindrical crossed elements joined integrally at their cross point contact with each other;

an elongate trough in a support post, said trough at right angles to said elongate trough of said mirror back; and

compression transmitting means urging said mirror back and said support post to close on said cross member engaging said troughs thereof.

3,918,320

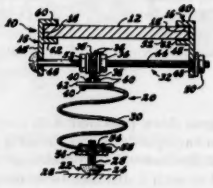
GOVERNOR DEVICE FOR VEHICLE ACCELERATOR PEDAL

William C. Glick, Jr., 4843 English Ave., Indianapolis, Ind. 46201, and Delbert W. Witte, 4621 Hartman Drive, Indianapolis, Ind. 46226

Filed Mar. 25, 1974, Ser. No. 454,748

Int. Cl.[2] G05G 1/14

U.S. Cl. 74—513 11 Claims



1. A governor device for a vehicle accelerator pedal, comprising:

first connector means connectingly engageable with the vehicle accelerator pedal;

a resiliently compressible governor assembly;

second connector means interconnecting the first con-

nector means and the said governor assembly;

said governor assembly having an abutment means abuttingly engageable with vehicle structure adjacent said pedal, and adjustable means locating the said abutment means at a selected position relative to the accelerator pedal when the governor assembly is connected to the accelerator pedal through both of said connector means, and there is provided body-means for the governor assembly which firmly maintain a selected overall length of the governor assembly but is yieldable to provide its resilient compressibility which permits it to nevertheless assume a lesser overall length;

in which the first connector means comprises a pair of pedal-gripper members, and said second connector means interconnect both of said pair;

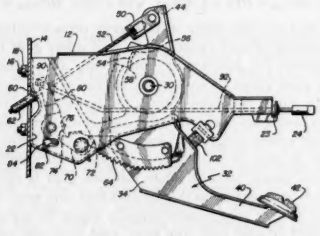
in a combination in which the said first connector means and the said second connector means are such that connection of the second connector means to the first connector means causes the first connector means to connectingly grip the said pedal by gripping both lateral edges of the pedal, and with the second connector means underlying the pedal and spanning across it in connection engagement with the pedal-gripper members of the first connector means at the lateral sides of the pedal.

3,918,321

PARKING BRAKE CONTROL ASSEMBLY

Kenneth Charles Hybarger, Jackson, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,086
Int. Cl.² G05G *7/04*
U.S. Cl. 74—516 **6 Claims**



1. A parking brake control mechanism for a vehicle, comprising a pedal-actuated lever responsive to a depressive force applied to an input end thereof for rotation about a central pivot axis, a flexible cable with one end thereof secured to an output end of said lever and the remote end of said cable connected to a brake mechanism, the position of securement of said cable to said lever rendering said cable taut at increasingly lessened radial distances from the pivot axis of said lever during rotation thereof to produce a pull force on said cable, an abutment commonly mounted on said lever for rotation about the lever pivot axis at a predetermined radial distance from the lever pivot axis at a predetermined radial distance from the lever pivot axis, said abutment rotative on rotation of the lever to deflect and raise said cable intermediately between the ends thereof on rotation of said lever to increase the distance of travel of the remote end of the cable caused by said lever rotation.

3,918,322

SNAP-IN LEVER ASSEMBLY

Frank Frier; Willard E. Graddy, both of Anderson, and Daniel W. Hyden, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1973, Ser. No. 426,729
Int. Cl.² G05G *01/04*; B25G *03/00*
U.S. Cl. 74—519 **3 Claims**

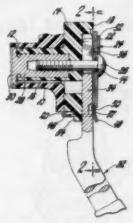
1. A snap-in lever assembly comprising

a body having a surface and an adjacent side wall, an elongated cavity formed in the surface and extending through the side wall,

a lever having an elongated terminal portion formed to nest within the cavity,

and means for enabling insertion of the terminal portion into the cavity and for rigidly securing the lever to the body including

a spring clip having a body portion disposed over the cavity and substantially coextensive therewith and having a depending tang formed in the spring clip and extending toward the cavity and



fastener means extending through the spring clip and through the cavity for securing the spring clip to the actuator body,

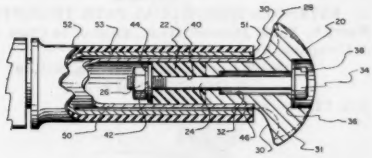
the terminal portion of the lever having a bifurcated end for providing clearance between the terminal portion and the fastener means and for permitting sliding insertion of the terminal portion into the cavity under the spring clip with the bifurcated end straddling the fastener, and having a recess for receiving the tang of the spring clip for preventing removal of the lever.

3,918,323

MOTORCYCLE THROTTLE-GRIP PROTECTOR

Barry H. Prager, 1665 Oak Patch, No. 108, Eugene, Oreg. 97402

Filed Dec. 16, 1974, Ser. No. 532,765
Int. Cl.² B62K *11/14*
U.S. Cl. 74—551.8 **8 Claims**



3. A vehicle handlebar and rotatable throttle control assembly for preventing the unintentional advancement of the throttle control by shielding the outer end thereof from contact with the ground when the vehicle is on its side, said assembly comprising:

a. a member having the shape of a handlebar, at least one end of said member being hollow;

b. an elongate twist-grip type throttle control mounted at said hollow end of said handlebar so as to rotate about a longitudinal axis;

c. a rigid body member having one end matingly inserted into the hollow end of said handlebar proximate the outer end of said rotatable throttle control, said inserted end having a width dimension substantially no smaller than the inside diameter of said hollow end of said handlebar;

d. fastening means at said inserted end of said body member for fixedly attaching said body member within said handlebar; and

e. protective means supported on the opposite end of said body member and protruding outwardly longitudinally beyond said outer end of said throttle control when said body member is fixedly attached within said handlebar

for shielding the outer end of said throttle control from contact with the ground when said vehicle is on its side.

3,918,324
MASTER FORM DEVICE FOR METAL-WORKING MACHINE TOOLS

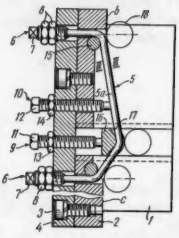
Vladimir Viktorovich Idel, ulitsa Gertsena 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 300,370, Oct. 24, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,771

Claims priority, application U.S.S.R., Jan. 28, 1972, 1738830

Int. Cl.² F16H *53/04*

U.S. Cl. 74—568 FS **5 Claims**



1. An adjustable master form device for controlling a working member of a machine tool comprising:

a base (1) including a shoulder (2);

a curvilinear guide member on said base and including a flexible fixed-length cable defining a guide profile for engagement by a follower roller operatively connected with and operating a working member;

support members projecting from said shoulder beneath said cable and anchoring opposite ends of said cable on said base shoulder,

said support members including adjustable means for changing the profile of the fixed-length flexible cable.

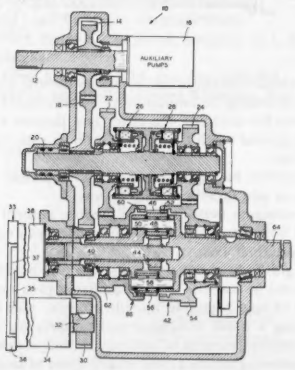
3,918,325
EXTENDED RANGE DUAL-PATH TRANSMISSION

Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 21, 1974, Ser. No. 435,401

Int. Cl.² F16H *47/04*

U.S. Cl. 74—687 **29 Claims**



1. A variable speed dual-path transmission with two infinitely variable speed ranges and having an extended total constant horsepower output range (HP_{TCOR}), said transmission comprising:

a. input means including means for providing input horsepower (HP_E);

b. final output means;

c. a pair of gear trains for alternately connecting said input means with said output means, said gear trains comprising two transmission ranges of different ratios and comprising one of said dual paths in each of said ranges;

d. each of said pair of gear trains including a planetary gear assembly, with a set of planet gears of a first planetary gear assembly of one gear train being intermeshed with a set of planet gears of a second planetary gear assembly of another gear train and a common carrier for both sets of planet gears;

e. said input means being drivingly connected to said sets of planet gears of said first and second planetary gear assemblies through first and second ring gears, respectively;

f. said common carrier comprising the sole output member of said pair of gear trains and being connected with said output means;

g. a sun gear meshed with the set of planet gears of said first planetary gear assembly and serving as the reaction member;

h. a reaction shaft connected to and in driving relation with said sun gear;

i. means for connecting said reaction shaft to said input means through a variable speed device (VSD), said variable speed device comprising another of said dual paths in each of said ranges, and providing a speed proportional to the speed of the input means on one and a variable speed on the other of said input means and reaction shaft, with the maximum horsepower that said variable speed device must be capable of transmitting (Max. HP_{VSD}) substantially fitting the equation:

$$\text{Max. } HP_{VSD} = HP_E \times \left[1/4 \ \left(\sqrt{(4 \times \text{Max. } HP_{TCOR} + 1)} - 1 \right) \right]$$

j. the end of said range of one gear train overlapping the beginning of said range of the said other gear train; and k. means for alternately connecting and disconnecting said gear trains to said input means at said overlapping range ends, whereby power is transmitted alternately from said gear trains to drive said output means through its two speed ranges with said transmission being regenerative in one of said speed ranges at substantially zero output speed, so that, when said sun gear is rotated, in a direction opposite to that of said first ring gear, at a pitch line velocity that is substantially equal to the pitch line velocity of said first ring gear, said common carrier and said output means remain substantially stationary.

3,918,326
BALANCER WITH FLEXIBLE GEAR TO MOVE WEIGHT

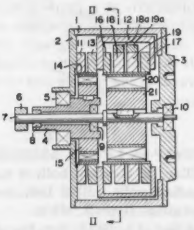
Kihachi Kida, Tokyo; Takahiro Akane, Tokorozawa; Satosi Hosoe, and Tadashi Sugita, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Hasegawa Haguruma, Tokyo, Japan

Filed Oct. 16, 1973, Ser. No. 406,958

Claims priority, application Japan, Sept. 8, 1972, 47-90099

Int. Cl.² F16F *15/10*; **F16H** *35/00*

U.S. Cl. 74—573 **5 Claims**



1. A balancer for regulating an eccentric mass of a machine to be rotated comprising a cylindrical casing having a device

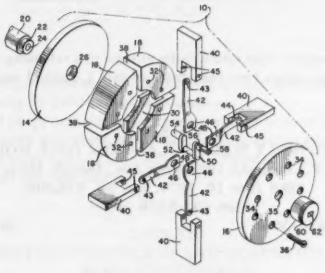
adapted to be fixed to the machine, a first inner gear secured to said casing, an intermediate member housed in said casing, a second inner gear secured to said intermediate member, a weight associated with said intermediate member, and first means for producing a relative rotation between said first and second inner gears comprising a flexible gear engaging said first and second inner gears, a wave generator in elliptical form for deflecting said flexible gear, and a shaft keyed to said wave generator, to cause movement of said weight relative to said casing.

3,918,327

MECHANICAL MOVEMENT DEVICE

Charles A. Christy, 201 Airport Drive, Farmington, N. Mex. 87401

Filed Feb. 5, 1974, Ser. No. 439,748
Int. Cl.² G05G 1/00
U.S. Cl. 74—600 **14 Claims**



1. A mechanical movement device for synchronized external motion in rotary motion, said device comprising a rotor assembly supported for rotation about a fixed axis and having slot means therein, slide means disposed in said slot means for rotation therewith and to slide therein, a crank element having coaxial trunnions extending through opposite sides of said rotor assembly and having a crank throw eccentric thereto, connecting means hingedly connecting said slide means to said crank throw in eccentric relationship to the center of rotation of said rotor assembly, said crank element being rotatably adjustable to various circumferential positions and having locking means for securing said crank element against undesired rotation, said slide means being rotated by said slot means as said rotor assembly rotates, said slide means moving with outer edges thereof tracing a circle eccentric to the center of said rotor assembly so that said outer edges extend out of said slot means at times and within said slot means at other times.

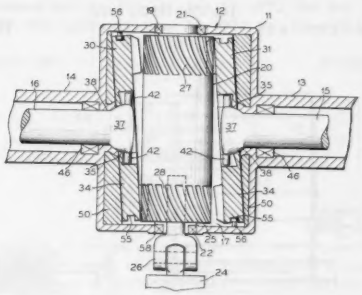
3,918,328

AXLE GEAR DRIVE

Randolph McKay, 3316 N. Damen Ave., Chicago, Ill. 60618

Filed July 19, 1973, Ser. No. 380,902
Int. Cl.² F16H 37/06
U.S. Cl. 74—665 F **1 Claim**

1. A non-differentiating gear train assembly driving the axles of a vehicle comprising: a housing, a cylindrical gear member in said housing having circumferential bands of gear teeth separated from one another positioned adjacent opposite axial ends of the cylindrical member, two side gears in said housing having axial gear teeth, said side gears driven by said cylindrical gear member, said side gears disposed on opposite sides of the cylindrical member, said side gears opposed to one another, one of said side gears driven by one of said bands and the other of said side gears driven by the other of said bands, said side gears driven in the same direction of rotation, said side gears disposed at an angle to the axis of the cylindrical gear member, fixed means carried by said housing maintaining the angulation of the side gears to the cylindrical gear member, and the side gears free to wobble on the ends of axles



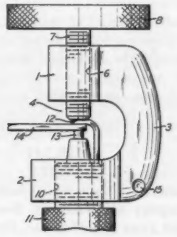
projecting at right angles to the cylindrical gear member, the axles attached to the side gears for rotation therewith.

3,918,329

SPARK PLUG GAP ADJUSTER

Paul O. W. Hopkinson, Gibsonia, Pa., assignor to St. Barnabas Free Home, Gibsonia, Pa. part interest

Filed Mar. 20, 1975, Ser. No. 560,226
Int. Cl.² B25B 1/10, 1/20
U.S. Cl. 81—3 R **6 Claims**

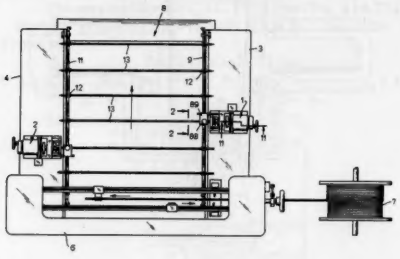


1. A spark plug gap adjuster comprising a frame provided with upper and lower portions and with a passage through its lower portion and a threaded passage through its upper portion, said passages being axially aligned and spaced apart by a recess in the frame extending laterally out to the outside of the frame, a screw rotatably mounted in the upper passage and projecting from its ends, and means at the upper end of the screw for turning it to lower and raise it in said upper passage, said lower passage being of a size to receive the threaded end of a spark plug, the frame being provided with means for holding a spark plug in said lower passage rigidly with its spark electrodes disposed in said recess directly beneath said screw, whereby when a spark gap gauge is inserted in said recess and between said electrodes the screw can be turned down to bend the screw-engaging electrode down as far as permitted by the gauge to thereby provide the required gap between the electrodes.

3,918,330
INSULATED WIRE CUTTING AND STRIPPING APPARATUS

Gerald E. Blaha, Waukesha, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Nov. 18, 1974, Ser. No. 524,395
Int. Cl.² H02G 1/12
U.S. Cl. 81—9.51 12 Claims



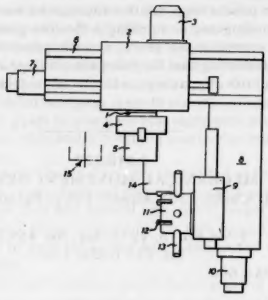
1. An insulated wire cutting and stripping apparatus for use in connection with an intermittently operable wire conveying mechanism, said apparatus comprising a stationary main frame positioned opposite to and at a fixed spacing from one side of said conveying mechanism; a tool slide reciprocably mounted on said main frame for movement into projected and retracted positions relative to said conveying mechanism; wire cutting and insulation stripping blades fixedly mounted on said tool slide, complementary wire cutting and insulation stripping blades reciprocably mounted on said tool slide in cooperative relation to said fixedly mounted wire cutting and insulation stripping blades; a crank shaft rotatably mounted on said main frame; a telescopically contractable and expandable connecting rod universally connected at one end thereof with said crank shaft; supporting means for said reciprocably mounted wire cutting and insulation stripping blades universally connected with the other end of said connecting rod, and resilient means operatively associated with said connecting rod for urging it into an expanded condition.

3,918,331
LATHES

Sven-Erik Svanstrom, Vasteras, Sweden, assignor to SMT Machine Company AB, Vasteras, Sweden

Filed June 3, 1974, Ser. No. 476,142
Claims priority, application Sweden, June 6, 1973, 73079477
Int. Cl.² B23B 3/18
U.S. Cl. 82—2 R 3 Claims

1. A lathe having a spindle and a turret wherein said spindle is positioned horizontally and arranged in a spindle headstock and is rectilinearly movable in a direction perpendicular to the center line of said spindle; said turret having an axis of rotation perpendicular to the center line of said spindle and at least substantially parallel to the direction of movement of said spindle headstock; said spindle headstock being movable in a horizontally rectilinearly direction; said turret being rectilinearly movable, with said turret being horizontally rectilinearly movable in the direction perpendicular to the horizontal direction of movement of said spindle headstock, and axis of rotation of said turret being horizontally orientated; said spindle headstock being horizontally rectilinearly movable between an operating position whereby a workpiece at said spindle cooperates with tools at said turret arranged for internal as well as external machining operations; a releasing position of said spindle entirely by the side of said turret; said spindle headstock and said turret being so horizontally rectilinearly movable along guides at an at least substantially L-

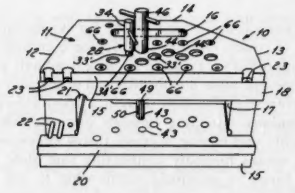


shaped support that said spindle at least in a releasing position is at a free space between stems of said L-shaped support.

3,918,332
SELECTIVELY WEDGE CLAMPING TOOL HOLDER

Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202

Filed June 10, 1974, Ser. No. 478,004
Int. Cl.² B23B 29/00
U.S. Cl. 82—36 R 26 Claims



1. A tool holder optionally employed to removably mount plural types of machine tool members, said holder comprising a relatively massive base, said holder base being provided with aligned parallel portions spaced substantially from one another and defining therebetween a cavity opening through a side of said base and proportioned to receive at least one of said machine tool members, at least one locator pin mounted and guided by said holder base in aligned bores in said respective portions thereof, said pin being adapted to project into said cavity into releasable locating engagement with a tool member so received in said cavity, and a wedging clamp rod also mounted and guided by said base in a further pair of aligned bores of said base portions to project into said cavity adjacent a tool member, said rod being provided with a wedging portion frictionally engageable with said tool member in clamping the latter to said base.

3,918,333
ADJUSTABLE TOOL HOLDER

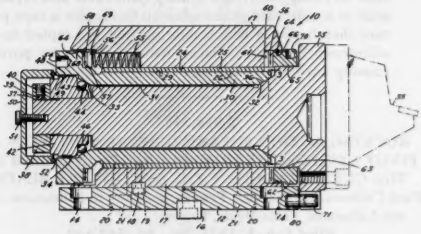
Gary R. Ebert, Dearborn, and Roy H. Flones, Clare, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 10, 1974, Ser. No. 468,965
Int. Cl.² B23B 29/00; B26D 1/00
U.S. Cl. 82—36 R 12 Claims

1. An adjustable tool holder adapted to receive a flanged or shank mounted tool comprising:

a. a body;

b. a shaft;
c. an eccentric bushing means;
d. a means for holding said eccentric bushings and said shaft in body;
e. an adjustment means for moving tool affixed to said shaft axially;



f. an adjustment means for moving tool in a plane perpendicular to axial movement; and
g. said perpendicular adjustment means is eccentric surface between said shaft means and bushing means wherein the eccentric surface and shaft are affixedly preloaded with a ball bearing and nut means.

3,918,334

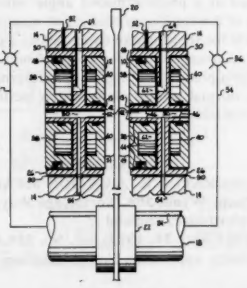
METHOD FOR GUIDANCE OF SAW BLADES UTILIZING BERNOULLI EFFECT

William H. Wilcox, deceased, late of Stockton, Calif. (by Elizabeth Wilcox, executrix), assignor to Sun Studs, Inc., Roseburg, Oreg.

Continuation of Ser. No. 333,980, Feb. 20, 1973, Pat. No. 3,850,060. This application June 26, 1974, Ser. No. 483,216The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.[2] B23D *47/00, 55/08;* **B27B** *5/29, 13/10*

U.S. Cl. 83—13 **4 Claims**



1. A method of guiding a saw blade which comprises:
a. exposing one side of said saw blade to a suction;
b. exposing the opposite side of said saw blade to a suction equal in magnitude to said first suction;
c. decreasing the suction on one side of said blade in response to the deflection of said blade toward said side, while simultaneously increasing the suction on the opposite side of said blade in response to said deflection; and
d. utilizing the suction imbalance so created to restore said blade to its undeflected position.

3,918,335

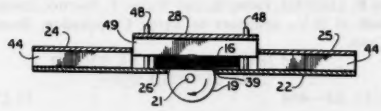
METHOD FOR FINISHING OVER-CUT PATTERN PIECES

Emmit F. Warnock, Tarrytown; Bobby Wayne Williamson, Vidalia; Gordon H. Ellington, Vidalia, and William O. Mitchell, Vidalia, all of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Division of Ser. No. 322,727, Jan. 11, 1973, Pat. No. 3,832,927. This application June 24, 1974, Ser. No. 482,169

Int. Cl.[2] B26D *1/14*

U.S. Cl. 83—19 **4 Claims**



1. A method of cutting garment pattern parts comprising placing a stack of sheets of fabric on a platen area, pressing the stack of sheets of fabric downwardly toward the platen area with a holding means defining a plurality of slots therethrough, moving the platen area and the holding means with the stack of sheets of fabric therebetween through a plurality of knives aligned with the slots of the holding means to cut the stack of sheets of fabric.

3,918,336

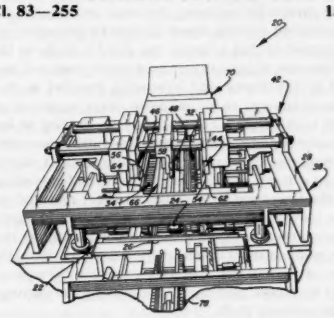
TRIMMER DRIVE ASSEMBLY

Keith S. Macey, Rocky River, and John J. Marciniak, Berea, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 28, 1974, Ser. No. 455,629

Int. Cl.[2] B23D *31/00;* **B26D** *5/22*

U.S. Cl. 83—255 **15 Claims**



1. An apparatus comprising means for moving sheet material articles along a sheet feed path, drive means for effecting intermittent operation of said means for moving sheet material articles, said drive means including a drive member connected with said means for moving sheet material articles, means for supporting said drive member for movement along a circular path, first and second linkage means for applying transversely directed forces to said drive member, said first linkage means includes a first link mounted for pivotal movement about a first axis and a second link pivotally connected with said first link and drive member, said second linkage means including a third link mounted for pivotal movement about said first axis and a fourth link pivotally connected with said third link and drive member, and cam means for effecting operation of said first and second linkage means to move said drive member along said circular path through a predetermined arcuate distance, for interrupting operation of said first and second linkage means and movement of said drive member along said circular path upon movement through of said drive member

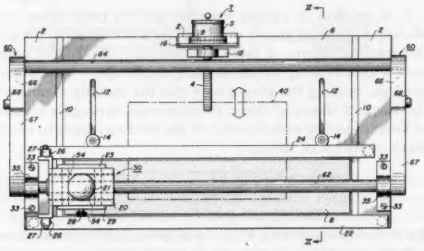
the predetermined arcuate distance, and for effecting operation of said first and second linkage means to continue movement of said drive member along said circular path, said cam means including first cam surface means for effecting operation of said first linkage means and second cam surface means for effecting operation of said second linkage means.

3,918,337

CUTTING DEVICE FOR ELASTOMERIC SHEET MATERIAL

Nero R. Lindblad, Palmyra, and Walter F. Werner, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 7, 1975, Ser. No. 539,124
Int. Cl.² B26D 5/10
U.S. Cl. 83—409 **15 Claims**



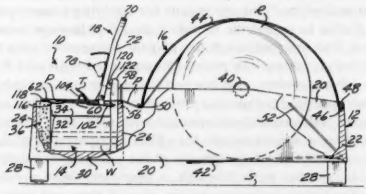
1. A cutting apparatus for making linear cuts of sheet material comprising a frame; a base plate within the frame having mounting means for securing the sheet material in a cutting position without causing stress of uneven pressures upon the sheet material so that a linear cut can be made in the sheet secured thereto; at least two spaced apart guide rail members, attached to the frame and extending parallel in the linear direction of the cut to be made in sheet material mounted upon the base plate; a cutting assembly having at least two guide members and cutting means, the cutting assembly being slidably mounted upon at least one support shaft, said support shaft being suitably secured to the frame and extending parallel with the linear cut to be made in sheet material mounted upon the base plate and located in a position to support and guide the cutting means in a cutting position along the linear cut to be made in sheet material upon the base plate, the guide members of the cutting assembly engaging the spaced apart guide rail members; and means for moving the cutting assembly on the support shaft.

3,918,338

GUMMED TAPE DISPENSER

James H. Higbee, 271 W. Livingston St., Banning, Calif. 92220

Filed Oct. 3, 1973, Ser. No. 403,053
Int. Cl.² B26D 9/00
U.S. Cl. 83—449 **10 Claims**



1. A tape dispenser comprising:

a support structure;

means for mounting a tape roll on the support structure; and

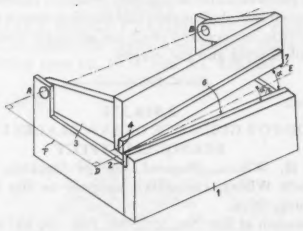
unitary means for servicing tape mounted on the support structure and including a shaft, a pair of superposed plates and tape shearing means journaled on said shaft for individual swinging about the axis thereof, said shaft adapted to be removably mounted on said support structure for pivoting about the axis of said shaft whereby the tape servicing means are readily removable and replaceable as a unit, said plates adapted to receive a tape portion therebetween which tape portion is adapted to be withdrawn from said plates, withdrawal of the portion causing unrolling of the tape roll.

3,918,339

ROCKING ACTION SHEARING APPARATUS WITH A PIVOT AXIS FOR THE MOVABLE BLADE INCLINED TO THE CUTTING EDGE OF THE STATIONARY BLADE

Paul Cailloux, Le Perreux, France, assignor to Promecam-Sisson-Lehmann, Saint-Denis, France

Filed Feb. 5, 1975, Ser. No. 547,449
Claims priority, application France, Feb. 8, 1974, 74.04255
Int. Cl.² B26D 5/00
U.S. Cl. 83—611 **5 Claims**



1. A rocking action shearing apparatus for shearing metal plates or the like, comprising stationary support means; a stationary blade having a rectilinear cutting edge and being fixedly mounted on said support means; a movable blade having a rectilinear cutting edge located substantially in one plane with the cutting edge of the fixed blade and being in this plane inclined at a predetermined angle with regard to the cutting edge of the stationary blade; and means mounting said movable blade for rocking movement about a pivot axis transversely spaced from the cutting edge of said movable blade and located in a plane bisecting said predetermined angle and substantially normal to said plane which includes the cutting edges of said blades.

3,918,340

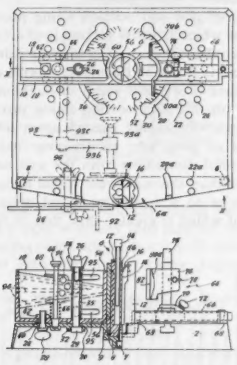
WORKPIECE LOCATION MEANS

Gordon Williams Wynn, 308, Northridge Way, Hemel Hempstead, Hertfordshire, England

Filed May 24, 1972, Ser. No. 256,446
Claims priority, application United Kingdom, May 25, 1971, 16955/71
Int. Cl.² B27G 5/02
U.S. Cl. 83—765 **17 Claims**

1. Cutting guide apparatus for making a saw cut in a workpiece and comprising, in combination, a carrier, workpiece location means, mounting means locating the workpiece location means on the carrier in an angularly adjustable manner, saw guide means comprising at least one saw guide member mounted on the carrier and projecting upwardly therefrom for providing a guide plane for a saw blade, said mounting means comprising a rotary bearing portion mounted with the workpiece location means for movement therewith and having a hollow central region within said bearing portion through which said saw guide member projects, said workpiece loca-

tion means comprising a member offset to one side of the saw guide plane and defining a location plane against which a first face of the workpiece can be registered whereby to vary the angular position of the workpiece relative the saw guide plane in dependence upon the angular adjustment of the workpiece location means, said workpiece location means further com-



prising gauging means disposed on the opposide saide of said saw guide plane to said mamber, said gauging means being displaceable on hte workpiece location means towards and away from the saw guide plane to be secured at an adjustable setting for location of a second face of the workpiece at a desired distance from the saw guide plane.

3,918,341

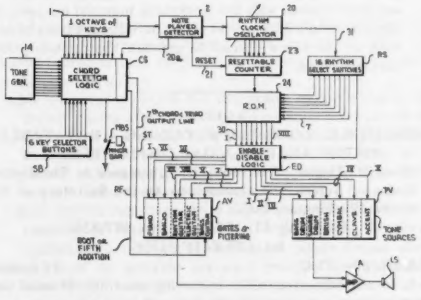
AUTOMATIC CHORD AND RHYTHM SYSTEM FOR ELECTRONIC ORGAN

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Mar. 25, 1974, Ser. No. 454,426

Int. Cl.² G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **21 Claims**



1. In an electric organ, an array of keys, means responsive to actuation of selected ones of said array of keys for sounding a triad chord, means responsive to actuation of the unselected ones of said array of keys for sounding a seventh chord, key selector switches, and means responsive to said key selector switches for selecting which of said keys shall be selected keys.

3,918,342

MONOPHONIC ELECTRONIC MUSICAL INSTRUMENT OF EQUAL TEMPERED SCALE

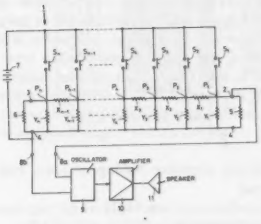
Fumio Mieda, Tokyo, Japan, assignor to Keio Giken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 504,878

Claims priority, application Japan, Sept. 14, 1973, 48-104276

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.01 **3 Claims**



1. A monophonic electronic musical instrument of an equal tempered scale comprising keyboard switches corresponding to notes of said equal tempered scale, a note voltage generator circuit for producing a note voltage corresponding to each of said keyboard switches in response to the depression of each of the keyboard switches, an oscillator for producing a tone signals having a frequency corresponding to said note voltage, an amplifier for amplifying said tone signal, and a speaker connected to said amplifier, characterized in that said note voltage generator circuit includes a plurality of first resistors connected in series between first and second terminals, a plurality of second resistors each connected between the connection point of adjacent ones of said plurality of first resistors and a third terminal common to said first and second resistors and third and fourth resistors connected between said first and third terminals and said second and third terminals, respectively; the connection points of adjacent ones of said plurality of first resistors are connected through said keyboard switches to the one end of a DC power source connected at the other end to said third terminal; output terminals are led out from said first and third terminals or the mid point of said third resistor and said third terminal; and if the diminishing ratio between adjacent notes of the equal tempered scale is taken as η, if the values of said first and second resistors are taken as r and R, respectively; and if the values of said third and fourth resistors are taken as R_0, they bear the following relationships:

$$\frac{R}{r} = \frac{\eta}{(\eta-1)^2} \quad (1)$$

$$\frac{R_0}{r} = \frac{1}{1-\eta} \quad (2).$$

3,918,343

ACCORDION PICKUP

Thomas Joseph Gumina, 1261 N. Vine St., Los Angeles, Calif. 90038

Filed Nov. 7, 1974, Ser. No. 521,905

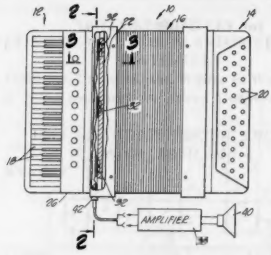
Int. Cl.² G10D *1/00*

U.S. Cl. 84—376 EA **12 Claims**

1. An accordion comprising:

a. a treble section;

b. a bass section;
c. a bellows positioned between said treble and bass sections;
d. a partition member, said partition member having sound absorbing characteristics and mounted between said treble section and said bellows;



e. said partition member having at least one depression therein; and
f. at least one electronic microphone pickup mounted proximate said depression.

3,918,344

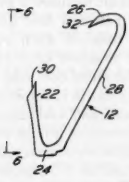
HORSESHOEING NAIL

Mark Warfel, R.D. 2, Halifax, Pa. 17032

Division of Ser. No. 387,825, Aug. 8, 1973. This application July 22, 1974, Ser. No. 490,830

Int. Cl.² A01L *7/10*

U.S. Cl. 85—12 **10 Claims**



1. A nail for securing a shoe to a hoof without hammering comprising a base, a first prong extending upwardly from said base, a shank extending upwardly from said base at an angle away from said first prong, a second prong connected to the upper end of said shank, said second prong extending generally towards said first prong, said prongs and shank being generally aligned with one another so as to lie in a common vertical plane, the included angle between said shank and said first prong being larger than the included angle between said shank and said second prong, and said second prong being shorter than said first prong.

3,918,345

THREAD FORMING FASTENERS

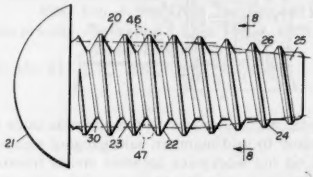
Harvey F. Phipard, Jr., South Dartmouth, Mass., assignor to Research Engineering & Manufacturing, Inc., New Bedford, Mass.

Continuation-in-part of Ser. No. 220,283, Aug. 29, 1962, abandoned, which is a division of Ser. No. 115,846, June 27, 1961, Pat. No. 3,195,156, which is a continuation-in-part of Ser. No. 819,167, June 9, 1959, abandoned, and Ser. No. 22,491, April 15, 1960, abandoned. This application Oct. 31, 1966, Ser. No. 590,699

Int. Cl.² F16B *25/00*

U.S. Cl. 85—46 **2 Claims**

1. In combination with apertured workpiece means, the provision of a thread forming fastener device particularly suitable for use with power drivers comprising:
a. shank and work-entering end portions,
b. a continuous rolled type thread on both said shank and end portions,
c. means on the fastener for applying an outwardly acting axial load thereto when installed,
d. the thread on said end portion being provided with a pitch surface which in cross section is of arcuate triangular lobular configuration having arcuate sides with intermediate arcuate lobes and each transverse cross section of such surface is of equal width throughout 360°,
e. the thread on said end portion being provided with a series of circumferentially spaced apart lobes with the leading side of each lobe progressing from a point of minimum radial dimension from the axis between lobes which is less than the maximum radial dimension of the preceding lobe to a maximum radial dimension at the crest thereof which is greater than that of the preceding



lobe defining a series of progressive thread swaging surfaces of increasing radius, thereby providing a relatively low driving torque for said device,
f. the difference between the minimum and maximum radial dimensions of any cross section of the pitch surface of the thread on said shank being not substantially more than two-thirds the maximum depth of the thread, whereby when said device is axially loaded, the continuous thread of said shank portion may engage throughout 360° with the complementary mating thread formed during driving of said device into the workpiece means to provide a relatively high stripping strength for the device, and
g. wherein the aperture in the workpiece means is of a size relative to the size of fastener such that the extent of swaging engagement between the swaging surfaces of successive lobes with the workpiece material amounts to approximately 25% or less of the peripheral extent of one turn of the screw thread to provide the relatively low driving torque.

3,918,346

FRICTIONAL LOCK FOR RETAINING A ROTATABLE PISTON AGAINST AXIAL DISPLACEMENT

William H. Ziegler, Waterford, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,838

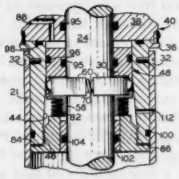
Int. Cl.² F41F *21/08*

U.S. Cl. 89—37 C **10 Claims**

1. In a fluidic system for imparting intermittent axial displacement to a piston slidably disposed in a cylinder, means for locking the piston in a stationary position at the conclusion of each displacement thereof, comprising,
a housing fixed within the interior of the cylinder, said housing having a tapered interior portion and a port for the entry therein of a flow of fluid,
a hollow carrier slidably fitted between said housing and the piston in position to be axially displaced by said flow of fluid,
a pair of arcuate locking elements seated in said carrier for transverse movement into and out of locking engagement with the piston,

a ball rotatably mounted in the exterior of each of said locking elements for protrusion from said carrier,

first spring means seated between said locking elements for urging said balls into rolling contact with said tapered interior portion of said housing, and



second spring means normally urging said carrier toward said entry port whereby said tapered interior portion of said housing cams said balls inwardly to force said locking elements into frictional locking engagement with the piston.

3,918,347

AUTOMATIC FIREARMS WITH MECHANICAL SERVO-ELEASE MECHANISM

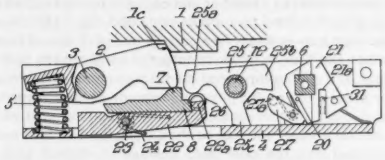
Bernard Pierre, Lyon; René Volle, Bourges, and Georges Simon, Saint-Germain-du-Puy, all of France, assignors to Etat Francais, Paris, France

Filed Oct. 29, 1973, Ser. No. 410,404

Claims priority, application France, Oct. 27, 1972, 72.38122

Int. Cl.² F41D *11/02*

U.S. Cl. 89—141 **5 Claims**



1. Automatic firearm (especially of small or medium caliber), of the type with an open breech, equipped with a mechanical servo-release mechanism, wherein said servo-release mechanism comprises:

a pivoting sear mounted in a removable casing borne by the breech casing of the firearm and constantly subject to the action of a first elastic return device sufficiently powerful to cause the retraction of said sear when the latter occupies its active position for which it retains in open rearward position the breech-mechanism of the firearm,

a sear control cam borne by a slider mounted in said casing capable of being displaced longitudinally forwards, against the action of a second elastic return device, starting from an extreme rearward position for which the control cam is separated from the sear which then occurs retracted by the first elastic return device, thereby passing through a succession of intermediate positions for which the control cam cooperates with the sear by displacing it gradually and imperatively to its active position, and thereby reaching finally a locked forward position for which said control cam temporarily blocks said sear in active position,

a neutralisable percussion control device, operating by drawing energy from a retracting part of the breech mechanism of the firearm and capable when it is not neutralised, of causing said slider to pass from its extreme rearward position to its extreme forward position against the action of the abovesaid second elastic return device, first neutralising means capable of rendering inoperative this percussion control device, said first neutralising means being servo-coupled in such a way that, on release of the firing trigger actuated by the crew of the firearm, that, when the crew acts on this release, the abovesaid first neutralising means come into action to prevent the rest of firing and to permit a burst of gunfire which continues until the crew ceases to hold said release,

and second neutralising means capable of rendering the locking device inoperative temporarily retaining the abovesaid slider in the vicinity of its extreme forward position, these second neutralising means being also servo-coupled to the abovesaid firing trigger release, in such a way that, when the crew acts on this release, the abovesaid second neutralising means come into action to unlock the slider bearing the control cam of the sear, which slider is then restored into its extreme rear position (for which the sear is retracted) by the action of the second above-mentioned elastic return device.

3,918,348

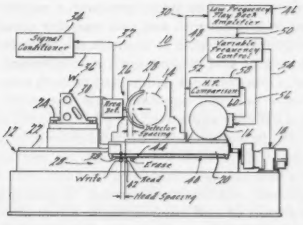
ADAPTIVE CONTROL SYSTEM

Rudi K. Runft, Warren, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Sept. 18, 1973, Ser. No. 398,427

Int. Cl.² B23Q *15/02*

U.S. Cl. 90—11 R **37 Claims**



1. For an apparatus for machining a workpiece having a varying cross-sectional area by a machining process including cutting means for removing a portion of said workpiece with the volume of said portion varying with variations in said cross-sectional area and rate means for establishing the rate of the machining process, a control system comprising:

sensing means for sensing said cross-sectional area at a portion of said workpiece to be machined in advance of machining thereof and for providing an output signal representative of said cross-sectional area and hence representative of the volume of said portion to be removed; and

control means responsive to said sensing means output signal and operatively associated with said rate means for adjusting the rate of said machining process in accordance with said sensed variations in said cross-sectional area so that said rate of said machine process is decreased with a sensed increase in the cross-sectional area and hence the volume of said portion to be removed and is increased with a sensed decrease in the cross-sectional area and hence the volume of said portion to be removed.

3,918,349

DEVICE FOR CONTROLLING THE RECIPROCATION OF A WORKING PISTON

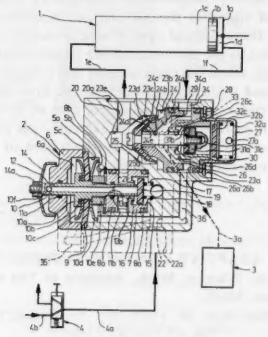
Thomas Nussbaumer, Zug, Switzerland, assignor to Adeola AG, Switzerland

Filed Mar. 5, 1974, Ser. No. 448,211

Claims priority, application Switzerland, Mar. 5, 1973, 3218/73

Int. Cl.[2] F15B 11/08, 13/042, 21/00

U.S. Cl. 91—5 5 Claims

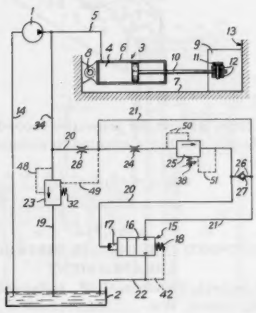


1. A device for reciprocating the working piston of a pneumatic drive unit comprising, in combination, a directional control valve with three ports and a control element movable between two distinct positions, with a first port being connected to a source of air under pressure, a second port being connected to atmosphere, and said movable control element being selectively operable to connect the third port to either said first port or said second port; a compressed air storage container; a control block connected to both said directional control valve and said container; said pneumatic drive unit including a cylinder and a working piston therein dividing said cylinder into first and second cylinder chambers; said control block being formed with first and second interior chambers and with a first passage connecting said first interior chamber to said second interior chamber and terminating in a first connection port of said control block; a first connection line connecting said first connection port to said first cylinder chamber; a hollow rod movable axially in said first interior chamber and having an outer end projecting externally from said control block and formed with a cross bore connecting the interior of said hollow rod, at its outer end, with atmosphere; a flexible diaphragm secured to the periphery of said rod and secured in said first interior chamber to divide said first interior chamber into pressure chambers on opposite sides of said flexible diaphragm; means in said first interior chamber defining an inlet chamber surrounding the inner end of said hollow rod; a second passage formed in said block and connecting said inlet chamber to a second connection port; a second connection line connecting said second connection port to said third port of said directional control valve; a main valve axially displaceable in said inlet chamber adjacent the inner end of said hollow rod; biasing means biasing said main valve in a direction to engage the inner end of said hollow rod to close said inner end; said block being formed with a first axial passage through which said hollow rod extends to define an annular main flow passage connecting said inlet chamber to said first passage, said main flow passage being closed by said main valve, under the influence of said biasing means, when said hollow rod is in a position in which its inner end is retracted inwardly beyond the adjacent end of said first axial passage to disengage said main valve; a third passage connecting said second passage to said first interior chamber on that side of said diaphragm nearer to the outer end of said hollow rod; said diaphragm being flexed, to shift said hollow rod axially, in accordance with the differential between the pressures in said pressure chambers on said opposite sides of said flexible diaphragm; said rod being movable to an end position wherein said main valve closes said first axial passage and the inner end of said hollow rod is disengaged from said main valve to connect the interior of said hollow rod with said first passage through said first axial passage to vent said first passage to atmosphere through said cross bore; a solid rod mounted for axial displacement in said second interior chamber; a cup-shaped secondary valve secured to said solid rod for movement therewith; a frustoconical insert in said second interior chamber surrounding said solid rod and defining therewith a second annular passage communicating at one end with said first passage; said frustoconical insert being formed with a radial passage therethrough closed by said cup-shaped secondary valve in a first position of said solid rod; a tubular piece in said second interior chamber in axially spaced relation to said insert and defining, with said solid rod, a third annular axial passage; the space between said frustoconical insert and said tubular piece defining a cavity communicating with said second and third annular axial passages; a third passage communicating with said cavity and terminating in a third connection port; a third connection line connecting said third connection port to said second cylinder chamber; a fourth connection port communicating with said second interior chamber exteriorly of said frustoconical insert; a fourth connection line connecting said fourth connection port to said compressed air storage container; means, including said control block, defining a cover chamber having a vent to atmosphere and surrounding the end of said solid rod extending from said third annular passage; a valve plate on said last-named end of said solid rod in said cover chamber movable with said solid rod to close said third annular axial passage in a second position of said solid rod in which said cup-shaped secondary valve uncovers said radial passage; and a valve seat defined in said control block between said first passage and said second interior chamber and engaged by said cup-shaped valve, in said second position of said solid rod, to block communication between said first passage and said second interior chamber and thus to block communication between said first passage and said compressed air storage container; whereby, upon movement of the control element of said directional control valve to a position connecting the first port of said directional control valve to its third port, fluid under pressure is supplied through said third passage to deflect said diaphragm to move said hollow rod in a direction to engage said main valve and to displace said main valve away from said second axial passage for flow of fluid under pressure from said second passage through said inlet chamber to said first passage and thus to said first cylinder chamber to displace said piston axially of said cylinder in a working stroke and, when said control element of said directional control valve is moved to its opposite position to connect the second port of said directional control valve to its third port, said second and third passages are connected to atmosphere to relieve the pressure on said diaphragm for flexing of said diaphragm in a direction to disengage said hollow rod from said main valve for seating of said main valve on the end of said second axial passage and establishment of communication between said first passage and the interior of said hollow rod for venting of the pressure in said first cylinder chamber to atmosphere through said hollow rod with the pressure in said compressed air storage container being effective in said second cylinder chamber to displace said piston toward said first cylinder chamber in an idle stroke; said frustoconical valve, during the working stroke of said piston, occupying a position connecting said first passage through said fourth connection port for supply of fluid under pressure to said compressed air storage container, as a valve plate opening said third annular axial passage for connection of said second cylinder chamber to said cover chamber for venting of the pressure in said second cylinder chamber to atmosphere through said vent, said control block is formed with a fourth passage connecting said cavity to that one of said pressure chambers on the side of said diaphragm more remote from the outer end of said hollow rod.

3,918,350
PRESSURIZED FLUID CONTROLLED VIBRATORS

Jacques P. Fontaine, Verberie, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France

Filed Nov. 30, 1973, Ser. No. 420,697
Claims priority, application France, Jan. 15, 1973, 73.01326
Int. Cl.[2] F01L 25/06
U.S. Cl. 91—48 7 Claims

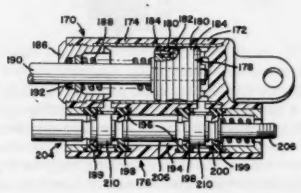


1. A pressurized fluid controlled vibrator comprising at least one pump (1), a fluid reservoir (2), a receiver (3) having at least one fluid receiving drive chamber (4) formed therein and including a first element (6) adapted to be fixed to a structure (7) and a second movable element (10) coupled to a body (9) of determined mass; a suction conduit (14) connecting said pump to the reservoir; a delivery conduit (5) connecting said pump to said drive chamber (4); and first checking means (15) for checking the value of the pressure of fluid contained in said delivery conduit; said first checking means including a two-way distributor (15) having a movable member (16) positioned therein; a fluid inlet chamber (17) and a first return means (18) for biasing said movable member in a direction opposite to that of fluid contained in said fluid inlet chamber (17); and four main conduits including a first main conduit (19) connected to said delivery conduit (5) through an intermediate conduit (34) to operatively connect the delivery conduit to said fluid reservoir (2); a main valve (23) disposed in said first conduit (19); said main valve being controlled by the antagonistic effects of a second return means (32) and the pressure of fluid contained in said first conduit between its connection to said intermediate conduit and said main valve; a second main conduit (20) connecting said intermediate conduit to said inlet chamber (17) of said two-way distributor (15); a third main conduit (21) connecting said second main conduit (20) to said distributor; said second main conduit (20) having a first calibrated orifice (24) disposed therein, said third main conduit being connected to said second main conduit between said first calibrated orifice and the connection of said second main conduit (20) to the intermediate conduit (5), and a fourth main conduit (22) connecting said distributor to said fluid reservoir (2); a calibrated control valve (25) being disposed in the second main conduit (20) downstream of said first calibrated orifice; said calibrated control valve being controlled by the antagonistic effects of a third return means (38) and of the pressure of the fluid contained in said second conduit between the first calibrated orifice and the calibrated control valve; a connecting conduit (26) connecting said second conduit (20) between said control valve (25) and the inlet chamber (17) of said distributor (15) to said third conduit (21); a non-return valve (27) being disposed in said connecting conduit (26) for allowing passage of fluid only from the second conduit to the third conduit; said movable member in said distributor being movable to a plurality of positions including a first position corresponding to the preponderance of the effect of said first return means (18) over that of the fluid contained in said inlet chamber (17), whereby the third (21) and fourth (22) conduits are obturated at the level of the distributor; a second position corresponding to the preponderance of the effect of the fluid contained in said inlet chamber (17) on that of the first return means (18) whereby communication is established at the level of the distributor between the third (21) and fourth (22) conduits.

3,918,351
INTEGRATED PISTON-CYLINDER AND CONTROL VALVE ASSEMBLY

Eugene W. Finke, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 104,874, Jan. 8, 1971, abandoned. This application June 13, 1973, Ser. No. 369,668
Int. Cl.[2] F15B 11/08, 13/04
U.S. Cl. 91—418 9 Claims



1. A piston-cylinder and control valve assembly, comprising: a tubular member defining a cylinder having first and second openings formed through the wall thereof at spaced-apart locations, a piston slidably received in the cylinder, the cylinder openings being disposed to enable the piston to be driven in either of two directions in the cylinder, an inlet tube having an inlet opening, moldable plastics material disposed around the cylinder and the inlet tube for holding the cylinder and the inlet tube in fixed relationship with respect to each other, a bore in the plastics material communicating with the atmosphere, the bore having shoulders, two pairs of spaced-apart resilient ring members received in the bore, one ring member of each pair being disposed against a respective shoulder, a separate spool bushing received and held by each pair of ring members, the bushings having respective first and second valve openings, passages through the plastics material providing communication between the first and second valve openings adjacent respective shoulders and the respective first and second cylinder openings, the bore having an inlet opening between the first and second valve openings communicating with the inlet tube, and a positionable spool valve comprised of two identical sections secured to each other, each section having a land cooperating with the respective spool bushing, the lands being disposed relative to the respective valve openings to alternately (1) provide communication between the inlet opening, the first valve opening and the first cylinder opening to drive the piston in one direction and to vent one side of the cylinder through the second cylinder opening and the second valve opening to the atmosphere and (2) provide communication between the inlet opening, the second valve opening and the second cylinder opening to drive the piston in the other direction and to vent the other side of the cylinder through the first cylinder opening and the first valve opening to the atmosphere.

3,918,352

DEVICE FOR FEEDING A PRESSURE MEDIUM TO A ROTATING DOUBLE ACTING PRESSURE CYLINDER FOR ACTUATING CLAMPING TOOLS

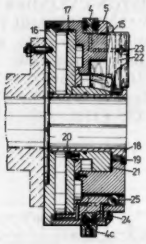
Kurt Reich, Dusseldorf, and Hans Bittrry, Meerbusch, both of Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Continuation of Ser. No. 298,613, Oct. 18, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,848

Claims priority, application Germany, Oct. 19, 1971, 2151938

Int. Cl. F01b *31/00*

U.S. Cl. 92—106 **5 Claims**



1. A device for feeding fluid pressure medium to opposite sides of a piston in a rotatable double-acting cylinder piston assembly, comprising a rotatable housing member having two annular, spaced radial surfaces, each with a circumferential groove therein, a stationary feeding ring having double-T-form cross section mounted on said rotatable housing member between said radial surfaces with annular radial side walls opposed to and facing said radial surfaces on said housing member, each said side wall having a circumferential channel opening laterally toward the opposed radial surface, an annular diaphragm disk in each channel having passage means therethrough opening toward the circumferential groove in the opposite radial surface, first communicating passages connecting to the grooves in said radial surfaces to convey fluid pressure medium selectively to opposite sides of said cylinder piston assembly to actuate said piston between two end positions, inlet connections on said feeding ring to supply fluid pressure medium selectively to actuate said piston and second communicating passages from each of said inlet connections to a corresponding channel in said feeding ring to supply said medium through said passage means in the diaphragm disk in said channel to the groove in the opposed radial surface and to press said diaphragm disk against said radial surface to seal said passage means and groove.

3,918,353

METHOD FOR FORMING A PACKING CONTAINER

Ernst Vögeli, Hermetschloostrasse 75, CH-8048 Zurich, Switzerland

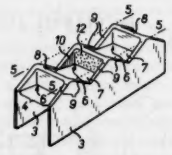
Division of Ser. No. 269,944, July 10, 1972, Pat. No. 3,847,281. This application Aug. 26, 1974, Ser. No. 500,554

Claims priority, application Switzerland, July 8, 1971, 10083/71

Int. Cl.² B31B *49/02, 7/26*

U.S. Cl. 93—37 SP **4 Claims**

1. A method for forming a packing container for receiving small objects, comprising cutting a row of a plurality of parallel spaced apart slots in a sheet material, whereby the ends of said slots are aligned, then bending said sheet material at a first angular velocity along a pair of first spaced apart parallel lines which extend perpendicular to said slots, to form a substantially U-shaped structure with the bent portions of the sheet material forming a pair of parallel side walls, whereby said material is bent through an angle α about each of said parallel first lines, and simultaneously bending a plurality of V-shaped ribs formed by the sheet material between said slots along second lines parallel to and intermediate said slots, at a second angular velocity different than said first angular velocity, whereby material at each side of said second lines is bent



through an angle β about the respective second lines, said first and second velocities being selected to maintain constant the relationship:

$$\text{sine } \alpha = \text{tangent } \beta/2$$

3,918,354

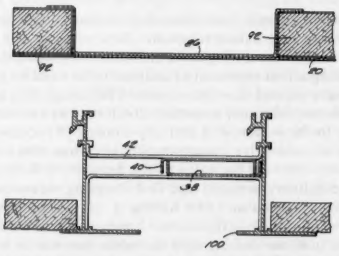
SUSPENDED CEILING AIR DISTRIBUTION ARRANGEMENT

Robert R. Lambert, Glendora, Calif., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 26, 1973, Ser. No. 428,117

Int. Cl.² F24F *7/00*

U.S. Cl. 98—40 D **15 Claims**



1. In combination in a suspended ceiling including a plurality of ceiling members, a plurality of ceiling support members, and means defining an elongated, linear slot in said ceiling, the improvement of an air delivery arrangement comprising, in combination,

means defining a generally elongated, linear pan having marginal ends and longitudinal sides,

means defining an elongated opening in said pan having an extension generally parallel to the longitudinal axis of said pan, the length of said opening being less than the length of said pan and said pan being otherwise closed,

means defining a generally elongated, linear plenum member having wall portions defining a plenum chamber,

means connecting said linear plenum member to said pan with said plenum chamber having open communication with said opening and with a portion of said wall portions engaged with a portion of said pan,

means for delivering air to said plenum chamber for discharge through said opening,

means at said opening for connection to the means defining said slot along only a limited length of said slot corresponding generally to the length of said opening so that air will be discharged through said slot only through said limited length,

and said pan being spaced from said ceiling support members so that air delivered to said plenum chamber passes through said opening for discharge through said slot while the length of said slot adjacent that through which air is discharged underlies a closed extension of said pan and provides an air return.

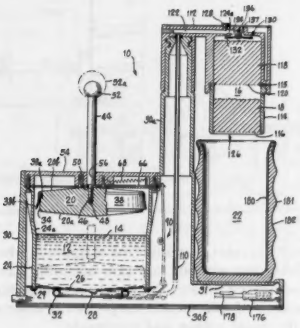
3,918,355
INFUSION APPARATUS AND METHOD

Robert L. Weber, 49 Clapboard Hill Road, New Canaan, Conn. 06840

Continuation-in-part of Ser. No. 283,562, Aug. 24, 1972, Pat. No. 3,804,635. This application Mar. 4, 1974, Ser. No. 482,639The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.

Int. Cl.[2] A47J *31/34*

U.S. Cl. 99—283 **5 Claims**



1. Apparatus for dispensing a quantity of a heated liquid comprising:

a. a chamber adapted to contain a liquid to be heated, said chamber including an upper portion, open at its top, and a narrower lower portion having an outlet at its bottom;

b. means for heating the liquid in said chamber;

c. a weight movable from an upper position within said upper portion and above the surface of the liquid to a lower position at the bottom of said chamber, said weight fitting closely within the lower portion and thereby as it descends closing the top of the lower portion and forcing the heated liquid under pressure through the outlet;

d. latch means movable between a latching position in which it holds the weight in its upper position and a retracted position in which the weight is free to descend;

e. means biasing said latch means toward its latching position;

f. means responsive to the temperature of the heated liquid; and

g. mechanical means operable by the temperature responsive means when the liquid has been heated to the predetermined temperature to move said latch to its retracted position against the force of said biasing means, thereby allowing the weight to descend to its lower posiition, and forcing the heated liquid through said outlet.

3,918,356
APPARATUS FOR THE PRODUCTION OF CHEESE

Wilhelm Fischer, Durach; Friedrich Kraush, Durach-Heberlings; Walter Riesner, Durach, and Hubert Sonnenmoser, Kempten, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,589

Int. Cl.[2] A01J *25/16;* **A23C** *19/02*

U.S. Cl. 99—452 **6 Claims**

1. An apparatus for coagulating liquid milk products for the production of soft cheese comprising:

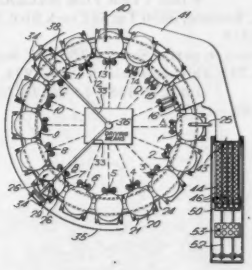
a. a circular trackway having smooth surfaced rails;

b. a plurality of wheel frames positioned on wheels that overlie and travel on said circular trackway, said wheel frames being rigidly linked to each other;

c. a corresponding number of vats that are pivotally mounted to said wheel frames and a tipping means intermediate said wheel frames and said vats to allow each vat to be independently tipped relative to the respective wheel frame;

d. a filling station comprising overhead means relative to said vats for the addition of liquid milk product and coagulating agents to said vats;

e. a cutting station comprising overhead cutting means relative to said vats that is moveable and insertable into each vat for cutting curd as it coagulates;



f. a discharge station comprising a discharge chute positioned circumfirentially about said circular trackway for receiving the whey and coagulated curd formed from at least two adjacent vats, said chute extending in a downwardly direction from an upper end where the whey and curd are received from said vats, to a lower end to which the whey and curd is transported; and

g. a drive means for sequentially displacing said wheel frames over said circular trackway in predetermined spaced time relationship at constant velocity from said filling station to said cutting station to said discharge station.

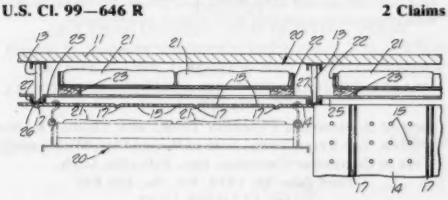
3,918,357
APPARATUS FOR PRESERVATIVE STORING AND TRANSPORTATION OF PRODUCE

Robert L. Tempero, San Jose, Calif., assignor to TransFresh Corporation, Salinas, Calif.

Filed Mar. 9, 1972, Ser. No. 233,032

Int. Cl.[2] B61D *17/18*

U.S. Cl. 99—646 R **2 Claims**



1. A transportable storage unit for repeated use in carrying a plurality of packages of perishable foodstuffs, comprising:

wall means defining an enclosed storage space within which the foodstuffs packages are carried, including ceiling, floor and side wall means;

spaced guide means affixed to the ceiling wall means;

open-top tray means constructed of a perforated material slidably received within said guide means, said tray means being supported solely along edge margins by said guide means, leaving a substantial area between the edge margins exposed;

gas permeable bag means restingly received within said tray means;

a quantity of hydrated lime received within said bag means in a generally horizontal layer of not more than about 2 inches thick which absorbs carbon dioxide added to the

storage space atmosphere by the foodstuffs during storage therein; and

moveable foraminous panels arranged below the guide means separating the storage unit into a ceiling space containing said tray means and a foodstuff storage space for said foodstuffs packages in spaced relation to said panels.

3,918,358

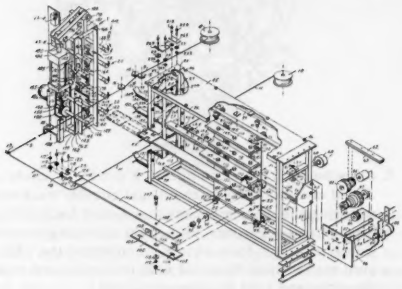
WIRE TYER FOR BALERS

Charles E. Burford, 3000 Turtle Creek Blvd. Suite 103, Dallas, Tex. 75219

Continuation-in-part of Ser. No. 180,592, Sept. 15, 1971, Pat. No. 3,789,751. This application Feb. 4, 1974, Ser. No. 439,159

Int. Cl.[2] B65B *13/06, 13/30*

U.S. Cl. 100—19 R **7 Claims**



1. Bale tying apparatus comprising: a twister support; guide means on said twister support; a carriage moveably secured to said guide means; means to move said carriage along said guide means; first and second twister hooks rotatably secured to said carriage; means to rotate said twister hooks; first and second cutter plates pivotally secured to the said twister support; a first arm pivotally secured to said first cutter plate; a second arm pivotally secured to said second cutter plate; a lever; means to pivotally secure said first and second arms to said lever; a fulcrum pivotally secured between said twister support and said lever; and means to move said lever such that said first and second arms move in opposite directions to sever wire engaged by said first and second cutter plates.

3,918,359

WASTE COMPACTOR WITH ADJUSTABLE BAG FILL CONTROL

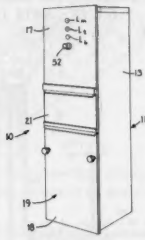
Ransom J. Hennells, Plymouth Twsp., and Thomas R. Scothorn, Van Buren Twsp., both of Wayne City, Mich., assignors to Compactor Company, Inc., Belleville, Mich.

Filed June 18, 1974, Ser. No. 480,585

Int. Cl.[2] B30B *15/22*

U.S. Cl. 100—52 **9 Claims**

1. In a waste compactor having a housing, means coacting with the housing for supporting thereon a receptacle, and extendible ram means mounted on the housing for permitting compacting of waste within said receptacle, and control means for permitting waste to be compacted into said receptacle only to a preselected depth, comprising the improvement wherein said control means includes timer means actuated in correspondence with the movement of said ram assembly in the compacting direction for controlling said depth, said timer means being preset to a preselected time interval which corresponds to the time required to move the ram assembly from an inactive retracted position to a partially extended position which corresponds to the receptacle being filled with trash to the preselected depth, reversing means operatively associated with said ram assembly for automatically retracting same when said ram assembly encounters a first external resistance of a first predetermined magnitude prior to timing out of said preselected time interval, and override means for permitting continued extension of said ram assembly and imposition thereon of a second resistance having a second magnitude



substantially greater than said first magnitude when said timer means times out without said ram assembly having encountered a resistance greater than said first magnitude, whereby the resistance of said second magnitude is effective for compacting the waste within said receptacle.

3,918,360

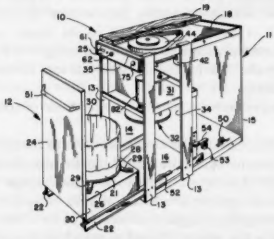
REFUSE COMPACTOR CONTROL SYSTEM

Jerome F. Stratman, Cypress, and John Novak, Anaheim, both of Calif., assignors to The Tappan Company, Mansfield, Ohio

Division of Ser. No. 195,991, Nov. 5, 1971, Pat. No. 3,821,927. This application Jan. 25, 1974, Ser. No. 436,594

Int. Cl.[2] B30B *1/18, 15/14*

U.S. Cl. 100—52 **8 Claims**

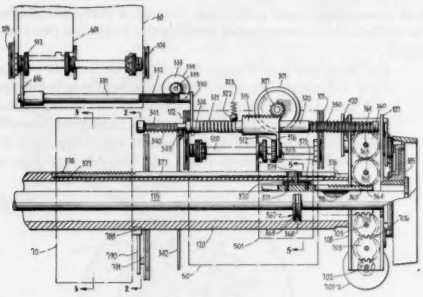


1. In a refuse compactor having a receptacle, means mounting said receptacle for movement between refuse receiving and refuse compacting positions and a ram reciprocable into and out of said receptacle in the refuse compacting position by means of an electric motor, means for controlling the direction of rotation of said motor and thus the direction of movement of said ram, first switch means for supplying energization to said motor and said direction controlling means, said first switch means being actuated when said ram is fully withdrawn from said receptacle, second switch means actuated in response to substantial slowing of said motor due to reaction force of refuse upon said ram to reverse the direction of rotation of said motor and withdraw said ram from said receptacle, and third switch means for reversing rotation of the motor in response to advance of the ram to a predetermined distance above the bottom of the receptacle.

3,918,361
PRINT HEAD FOR A POSTAGE METER

Arthur J. Malavazos, deceased, late of Hayward, Calif., and by Gregory A. Malavazos, administrator, 16047 Carolyn St., San Leandro, Calif. 94577

Filed Apr. 3, 1974, Ser. No. 457,595
Int. Cl.² B41L *47/46*
U.S. Cl. 101—91 **14 Claims**



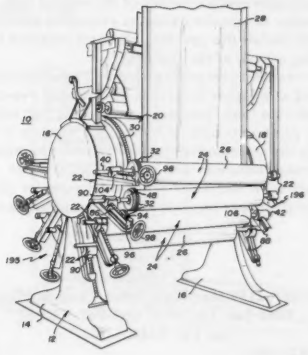
14. An arithmetic and printing unit for a postage meter comprising:

1. a cylindrical hollow main drive shaft;
2. means for mounting said drive shaft for rotation;
3. means for cyclically rotating said drive shaft;
4. an ascending register and a descending register;
5. a print head mounted on said drive shaft;
6. a manually operative selection mechanism for selecting values to be registered in said registers and in said print head;
7. a mutilated drum acutator mounted on said drive shaft;
8. means controlled by said selection mechanism for registering a selected value in one of said registers by said actuator in accordance with a value set in said selection mechanism;
9. a second mutilated drum actuator;
10. means driven by said main drive shaft for driving said second mutilated drum actuator;
11. means controlled by said selection mechanism for registering the selected value in said second register by said second actuator in accordance with the selected value set in the selection mechanism simultaneously with the registration of said value in said one of said registers;
12. value stamping members positionably mounted within said print head for printing a stamp value on mail matter;
13. auxiliary printing members carried by said print head;
14. a plurality of setting members slidably but nonrotatably mounted within said hollow drive shaft, some of said setting members being associated with the value stamping members and the others of said members being associated with said auxiliary printing members;
15. means operated by said selection mechanism for positioning the said some of said setting members to a selected value position;
16. manually operated setting devices for setting the others of said setting members;
17. exterior slides slidably mounted on the exterior of said drive shaft;
18. means for permanently connecting each of said setting members to one of said exterior slides through the wall of said shaft and in all angular positions of said shaft; and
19. means for operatively connecting said exterior slides to said value stamping members and said auxiliary printing members, respectively.

3,918,362
PIVOTAL ROTARY SCREEN SUPPORT AND CONTINUOUS DRIVE THEREFOR

Thomas Marino, Totowa Boro.; John Kreeft, Wyckoff, and Peter Stanislaw, Stockhom, all of N.J., assignors to Morrison Machine Co., Paterson, N.J.

Filed Oct. 11, 1973, Ser. No. 405,264
Int. Cl.² B41F *15/10, 5/18*
U.S. Cl. 101—115 **21 Claims**



1. A screen printing machine comprising:

a frame;

a backing member supported by said frame;

at least one rotary screen assembly rotatably carried by said frame and adjustably positionable between printing engagement and away from printing engagement with said backing member, said assembly including a rotatable screen and means for pivotally supporting said screen assembly at a point beyond one end of said screen;

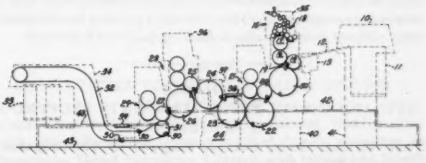
moving means for moving said rotary screen assembly away from printing engagement with said backing member about said supporting means;

means for rotating said rotatable screen when said rotary screen assembly is in printing engagement and is away from printing engagement with said backing member.

3,918,363
MULTICOLOR SHEET-FED PRINTING PRESS

Donald L. Southam, Brecksville, and Howard J. Seel, Cleveland, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Apr. 1, 1971, Ser. No. 130,167
Int. Cl.² B41F *7/06*
U.S. Cl. 101—183 **4 Claims**



1. A multicolor sheet-fed printing press comprising first and second like-constructed and like-facing two-color printing units each of which includes an upper printing couple having a first impression cylinder, a lower printing couple having a second impression cylinder which is offset downwardly and forwardly approximately 45° from the upper couple in a manner which eliminates the possibility of an operator standing between the upper and lower couples of each unit, and a transfer cylinder between the first and second impression

cylinders of each unit and an operator platform below and along the side of the lower printing couple remote from the upper couple of each said two-color unit, each of said impression cylinders and the transfer cylinder of each unit having at least one set of sheet-carrying gripper fingers thereon,

an uneven number of cooperating, adjacent transfer cylinders each of which includes at least one set of sheet-carrying gripper fingers thereon for receiving sheets from the gripper fingers of said second impression cylinder of the first unit and transferring them to the gripper fingers of the first impression cylinder of the second unit,

said number of transfer cylinders extending generally horizontally below the operator platform adjacent the lower printing couple of the first unit,

the improvement comprising: said first two-color unit being located at a higher level than said second two-color unit whereby the lower printing couple of the first unit and the upper printing couple of the second unit are at approximately the same horizontal level in order to minimize the horizontal distance said number of transfer cylinders extends from the lower impression cylinder of the first unit to the upper impression cylinder of the second unit.

3,918,364

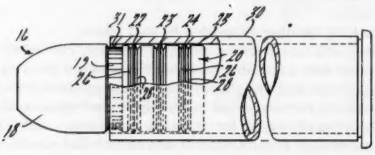
BULLET

Morris J. Duer, 4157 Mar-Moor Drive, Lansing, Mich. 48917

Filed Jan. 21, 1974, Ser. No. 435,037

Int. Cl.² F42B *11/02*

U.S. Cl. 102—92.1 **5 Claims**



1. A bullet for use with a previously fired cartridge case having a neck portion defining an internal cylindrical passageway, said bullet having a nose portion adapted to project from said case and an integral cylindrical butt portion adapted to be received in said internal passageway defined by said neck portion of said cartridge case, said butt portion having an outside diameter corresponding to a predetermined caliber and less than the inside diameter of said neck portion, an annular ridge formed on said butt portion and projecting beyond the surface of said butt portion, said butt portion defining an annular groove adjacent to said ridge, said ridge having a diameter greater than the inside diameter of said neck portion, said ridge having a relatively thin section adjacent its outer circumference deflectable upon entry into said internal passageway to retain said butt portion in said passageway without substantially deflecting said neck portion.

3,918,365

NEW AND USEFUL IMPROVEMENTS IN PROPERGOLS OR PROPELLANTS

Paul Arribat, Paris, France, assignor to The Republic of France, Paris, France

Continuation of Ser. No. 181,909, Sept. 20, 1971, abandoned.

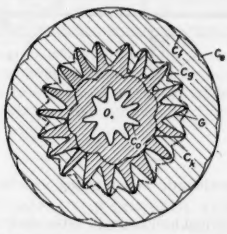
This application Feb. 15, 1974, Ser. No. 442,849

Int. Cl.² F42B *1/00*

U.S. Cl. 102—101 **13 Claims**

1. A solid propellant for use as a gas generator, particularly for the reaction propulsion of vehicles in space or in a gaseous or liquid medium, said propellant having a lateral outer surface which is a cyclinder of revolution and which does not participate in combustion and the propellant having a lateral inner surface defining a central cavity of a shape elongated in the direction of the axis of the cylinder, the inner surface being ignitable at the initial instant of firing, and wherein said solid propellant is formed from two propergols having different speeds of combustion, the two propergols contacting one another without interruption along a continuous separation surface or separatrix surrounding the inner surface, the more rapidly combustible propergol occupying the space between the inner surface and the separatrix and the more slowly combustible propergol occupying the remaining volume of the solid propellant between the separatrix and the outer surface and wherein the solid propellant through a plane perpendicular to the axis of the cylinder satisfies the following two conditions:

1. the inner surface is closed, continuous, and is substantially star-shaped having p branches with p at least equal to 3, the shape of the star being such that the rapid phase of the combustion in which only the rapidly combustible propergol burns, ends at the instant when the section of the surface of combustion is a line formed only of p con-



secutive arcs having their concavity towards a point and forming a curve parallel to a portion of the end of a different branch of the star, said arcs being composed substantially of circular arcs whose centers of curvature are situated on p radii of said inner surface, each radius intersection said inner contour at a point of the end of a different star branch; and

2. the separatrix does not touch the outer surface or the inner surface and has substantially the shape of a star having ν branches, with ν at least equal to p, the separatrix star shape being such that toward the end of the slow phase of the combustion in which only the more slowly combustible propergol burns, the cross section of the surface of combustion which reaches said outer surface is a line formed solely of ν consecutive arcs having their concavity towards said point, being substantially tangential to said outer surface, and being placed opposite the end of one of said ν branches of said separatrix, said ν arcs being themselves substantially composed of circular arcs whose centers are all situated in the vicinities of the ends of said ν star branches.

3,918,366

SHIP SECTION TRANSFER ASSEMBLY

Russell V. Noah, Covina, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

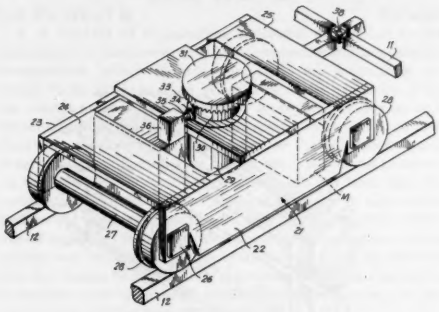
Filed July 15, 1974, Ser. No. 488,530

Int. Cl.² B61B *12/00*

U.S. Cl. 104—1 R **4 Claims**

1. Apparatus for the transfer of ship sub-assemblies or the like relative to a ship hull structure, comprising a gridway mounted on a horizontal support surface, said gridway including first and second pluralities of parallel, horizontally spaced apart, intersecting tracks, a carriage means including a beam member for supporting a hull sub-assembly, said beam member being vertically displaced from said gridway, a plurality of horizontally spaced-apart fixed stanchions depending from said beam member, said stanchions terminating in coplanar support portions, a plurality of vertically directed hydraulic

piston and cylinder assemblies having free ends and ends fixed to said beam member, said assemblies being vertically shiftable between extended and retracted positions, the piston and cylinder components of said assemblies being relatively rotatable, said assemblies being spaced in accordance with the spacing between parallel tracks, a truck member fixed to the free end of each said hydraulic assembly, wheel means on said truck members for movably mounted said truck members on said tracks, said beam member being supported by said stan-



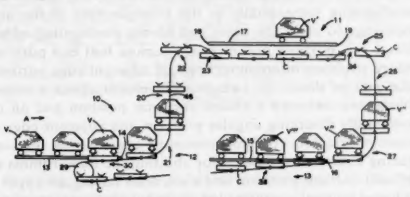
chions engaging said surface in said retracted limiting position of said hydraulic assembly, and by the engagement of said wheel means and tracks in the said extended limiting position, said wheel means being vertically spaced from said tracks in said retracted limiting position whereby said trucks may be rotated relative to said beam member selectively to align said wheel means with said first or said second plurality of tracks, to enable said carriage to move in a non-linear path on said gridway.

3,918,367

TRANSPORT SYSTEM

Mihai Alimanestianu, and Nicholas M. Alimanestianu, both of Upper Nyack, N.Y., assignors to Mihai Alimanestianu, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,687
Int. Cl.² B61J *3/00*
U.S. Cl. 104—88 **15 Claims**



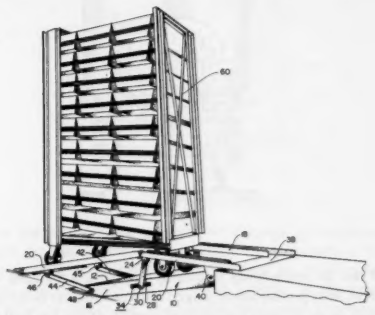
1. A transportation system comprising a moving vehicle and carrier means for engaging said moving vehicle, guide means for directing said moving vehicle in a substantially horizontal rectilinear path to a given point in said path, guide means for directing said carrier means in a rectilinear path converging with said first mentioned path whereby said carrier means will meet said vehicle at said given point in said first mentioned path and said carrier means will engage said vehicle, said first and second guide means being arranged relative to each other to effect the engagement of said carrier means with said vehicle while said carrier means and said vehicle are in motion, said second guide means including a first portion operative to effect a progressive separation of said vehicle from said first guide means, said second guide means including a second portion operative to effect a conjoint movement of said vehicle and carrier means in a curvilinear path portion in a verticle plane, said second guide means including a third portion operative to effect the further movement of said vehicle and carrier means in a substantially vertical path.

3,918,368

ADJUSTABLE RAMP

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed Dec. 19, 1974, Ser. No. 534,635
Int. Cl.² B65G *11/12*
U.S. Cl. 104—134 **3 Claims**



1. A ramp assembly for loading and unloading a wheeled rack between a lower surface and an upper surface, said wheeled rack having a first pair of wheels and a second pair of wheels at the respective ends thereof with the wheels of the first pair being displaced apart a greater distance than the wheels of the second pair, said assembly including: a generally rectangular structure to be placed in an inclined position between the upper surface and the lower surface to define an inclined surface for receiving the wheels of the second pair; a pair of side channels mounted at the respective sides of the rectangular structure and displaced upwardly from the inclined surface thereof to receive the wheels of the first pair, each of the side channels including a first section and a second section hinged to one another at an intermediate point; means for raising and lowering the intermediate point of each of the side channels to establish a first section of each of the side channels in a generally horizontal position, and to establish the second section of each of the side channels in a position essentially parallel to the inclined surface of the rectangular structure, said last-named means comprising a pair of side bars pivotally coupling the respective side channels to the corresponding side of the rectangular structure; and adjustable means for supporting at least one end of each of the side bars at different pivotal positions to permit the intermediate point of each of the side channels to be established at different levels with respect to the inclined surface of the rectangular structure.

3,918,369

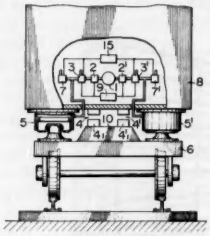
ROLL STABILIZED PNEUMATICALLY SPRUNG RAILWAY CAR

Takashi Kitaoka, Amagasaki; Yasuhiro Shirane, Nishinomiya, and Junzo Yamada, Toyonaka, all of Japan, assignors to Sumitomo Metal Industries Limited and Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 255,153, May 19, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,757
Int. Cl.² B61F *5/10, 5/24, 13/00*; B61H *11/00*
U.S. Cl. 105—164 **3 Claims**

1. In a safeguard system for controlling the roll of a car body of a railway car, the system including air springs arranged between the body and bolster of the railway car, an air reservoir, air feeding means and air exhausting means for respec-

tively automatically feeding air into and exhausting air out of the air springs, the air feeding means and air exhausting means including air feeding valves and air exhausting valves, respectively, car body roll control means for controlling the air feeding means and air exhausting means, a plurality of pipes connecting the air springs with the air reservoir with the air feeding valves and the air exhausting valves being arranged within the pipes, and the improvement comprising checking means for controlling the operation of the air feeding valves



and the air exhausting valves by applying activating signals thereto, stopper means arranged between the car body and the bolster so as to limit the vertical motion of the car body without obstructing the extension and contraction of the air springs and the car body roll controlling action such that when the control means fails the feeding and exhausting valves are activated in response to the actuation of said checking means such that said stopper means limits the movement of said car body thereby maintaining the relationship between the car body and the bolster in a neutral position.

3,918,370

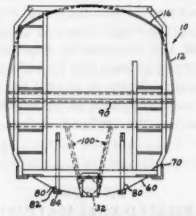
THROUGH SILL FOR RAILWAY CARS

George C. Campbell, Overland; James C. Hammonds, and Dallas W. Rollins, both of St. Charles, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 5, 1974, Ser. No. 439,781

Int. Cl.² B61D 7/00

U.S. Cl. 105—416 **25 Claims**



1. A center sill comprising:

in cross section an enclosed quadrilateral tube adapted to be placed in a railway hopper car; said quadrilateral having an apex adapted to extend upwardly into a railway car hopper making an angle of about 30° to 60° to the horizontal and a lower apex adapted to extend downwardly into a railway hopper car; said center sill further comprising opposite end portions which are adapted to receive railway car draft gear, and transition sections comprising a portion of a railway car center filler joining each of said end portions to said quadrilateral tube.

3,918,371

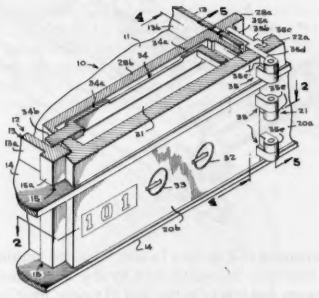
SAFE DEPOSIT DOOR AND LOCK CONSTRUCTION

Klaus W. Gartner, Downey, and Tim M. Uyeda, South San Gabriel, both of Calif., assignors to Sargent & Greenleaf, Inc., Rochester, N.Y.

Filed July 26, 1974, Ser. No. 492,979

Int. Cl.² E05G 1/00

U.S. Cl. 109—64 **14 Claims**



1. A door and door mounting assembly for mounting a companion pair of hinged doors in a pair of laterally aligned access openings flanking a common vertical reference plane between them, comprising wall members defining frames surrounding said pair of access openings including a vertical partition between said pair of access openings having a pair of vertically spaced mounting openings extending entirely therethrough of predetermined cross-sectional shape and located near the forward edge thereof, a pair of laterally spaced doors conforming substantially to the configuration of the access openings to close the same and having confronting adjacent hinge end portions and mutually remote bolt end portions, a hinge structure interconnecting said adjacent edge portions of the pair of doors for swinging movement about a common hinge axis between a closed coplanar position and an open outwardly diverging angular position, the adjacent edge portions of said doors defining mounting edges having rearwardly facing abutment shoulders for abutting the forwardmost edge of said vertical partition and each door having an upper and a lower integral mounting lug projecting inwardly toward said common plane and forming with the lugs of the companion door upper and lower complementary pairs of lugs extending into the uppermost and lowermost of the pair of mounting openings respectively when said doors are swung to said closed position for coupling the doors to the vertical partition, the respective upper and lower complementary pairs of lugs each having cross sections in said common plane collectively defining for each pair a shape conforming to the shape of the uppermost and lowermost mounting openings respectively whereby each complementary pair of lugs fully occupies its associated mounting opening when the doors are in closed position, and shoulder means at the free edges of the doors for releasably restraining each door in closed position in its access opening to coact with the lug formation of such closed door and the associated mounting opening receiving the same in supporting the companion door hinged thereto when such companion door is swung to open position.

3,918,372
METHOD OF INCINERATING PRE-TREATED INDUSTRIAL WASTES

Ernst Schuster, Gummersbach, Germany, assignor to L. & C. Steinmuller GmbH, Germany

Division of Ser. No. 435,089, Jan. 21, 1974. This application Nov. 25, 1974, Ser. No. 527,028

Claims priority, application Germany, Jan. 30, 1974, 23619047; Jan. 23, 1973, 2303140

Int. Cl.² F23G *7/00*

U.S. Cl. 110—7 R **8 Claims**

1. A method of incinerating industrial wastes fed to the incinerator in containers of different contents and of unknown composition, which includes the steps of: pretreating the wastes to be incinerated by volatilizing under exclusion of air the wastes to be incinerated while supplying volatilizing heat thereto, feeding the thus obtained vapors and volatilized residues into the combustion chamber of the incinerator, and determining the combustion air for the combustion chamber on the basis of the quantity of wastes fed per hour into the combustion chamber and on the heating power of said wastes and on the air excess-coefficient and feeding the thus determined quantity of air into the combustion chamber of the incinerator, the quantity of combustion air being so selected that the wastes being fed into the combustion chamber of the incinerator per time unit, especially those reacting at the fastest rate, will be burned completely.

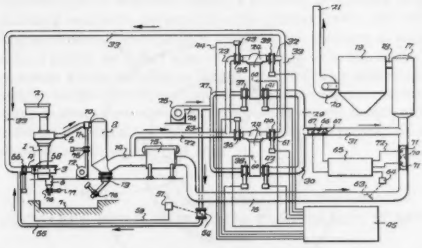
3,918,373
SOLID WASTE DISPOSAL SYSTEM

Jack J. Fritz, Buffalo, and Theodore W. Lucas, Jr., Williamsville, both of N.Y., assignors to Andco Incorporated, Buffalo, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,814

Int. Cl. F23g *7/00*

U.S. Cl. 110—8 R **3 Claims**



3. In a slagging pyrolysis solid waste disposal system having a combustion chamber, energy conversion means, and means for delivering gaseous products of combustion to said energy converstion means, a regenerator means for preheating combustion air, means for diverting a portion of the gaseous products of combustion from said energy conversion means through said regenerator means, means for delivering combustion air through said regenerator means, for being heated thereby, to said combustion chamber, and flow control means for varying the relative proportion of combustion products diverted to said regenerator means to maintain a predetermined flow of combustion products thereto, siad flow control means including means to monitor the downstream flows from said regenerator means and said energy conversion means and valve means operable in response to said monitoring means to control the flow of combustion products in one of said downstream flows in response to the flow of combustion products from the other of said downstream flows to thereby control the flow of combustion products to said regenerator system.

3,918,374
METHOD FOR THE DISPOSAL OF GARBAGE BY MULTI-STAGE THERMAL DECOMPOSITION

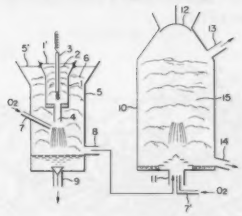
Minoru Yamamoto, Yokohama, and Sho Matsumi, Komae, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1975, Ser. No. 538,123

Claims priority, application Japan, Feb. 6, 1974, 49-14531

Int. Cl.² F23G *5/12*

U.S. Cl. 110—8 E **4 Claims**



1. A method for the disposal of garbage by multi-stage thermal decomposition, characterized by: thermally decomposing garbage at the first stage by external heat requiring no oxygen; and thermally decomposing garbage at the second and following stages by combustion heat, said combustion heat being generated by combustion of the whole quantity of generated gas obtained by the thermal decomposition of garbage at the stage directly before the relevant stage with pure oxygen supplied in an amount corresponding to the theoretical quantity of oxygen for this combustion.

3,918,375
DEVICE FOR ELIMINATING AN ADHERENT SUBSTANCES IN THE INDUSTRIAL WASTE INCINERATOR

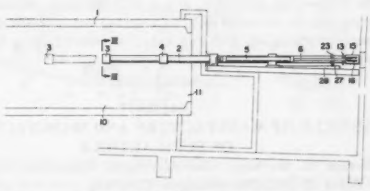
Shuichi Hayakawa, Tokyo; Toru Hironaka; Yukinori Osada, both of Yamaguchi; Heihachiro Tamura, Tokyo; Toru Takayama, Chiba, and Shiro Saito, Kanagawa, all of Japan, assignors to Sanki Engineering Co., Ltd. and Mitsui Petrochemical Industry Co., Ltd., both of Tokyo, Japan

Filed July 16, 1974, Ser. No. 489,062

Claims priority, application Japan, Mar. 15, 1974, 49-30420

Int. Cl.² F23G *5/06;* **B08B** *9/08*

U.S. Cl. 110—14 **6 Claims**



1. A device for eliminating adherent substances on a furnace wall in an industrial waste incinerator comprising:

a rotary kiln type incinerator;

a hollow rod which is inserted slidably in the interior of the furnace body from that side of said incinerator on which an opening for charging a material to-be-incinerated is located;

scrapers for removing said adherent substances on said furnace wall, which are provided at the front end of said hollow rod and on at least one intermediate part thereof; an air injection nozzle which is open at a position adjacent to a lower edge of at least one of said scrapers; and

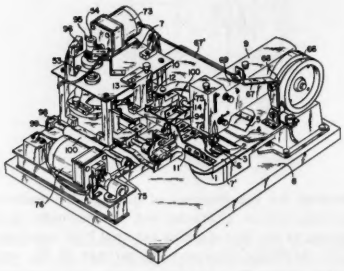
means for introducing the compressed air to said air injection nozzle.

3,918,376

TUCKING APPARATUS FOR CURTAIN OR LIKE CLOTH

Fukujiro Nishiwaki, Maebashi, and Tomii Yoshino, Higashikurume, both of Japan, assignors to C. Kondo & Co., Ltd., Kobe, Japan

Filed May 1, 1974, Ser. No. 465,746
Claims priority, application Japan, June 19, 1973, 48-69592
Int. Cl.² D05B *21/00, 35/08*
U.S. Cl. 112—121.15 **6 Claims**



1. An apparatus for tucking cloth with a sewing machine, said apparatus comprising a base, a slider arranged on said base for sliding movement in both the transverse and lengthwise directions with respect to the cloth to be tucked, a working plate fixedly secured to said slider to extend horizontally therefrom and having a working position for guiding and supporting the cloth, a first presser pivotably connected to said slider and extending transversely of the cloth for lifting and lowering movement over the working plate, a second presser on the base positioned on the working plate adjacent said first presser in parallel relation thereto, an upper spatula and a lower spatula mounted on the slider for lifting and lowering movement over the working plate and for backward and forward movement relative to the working position of the working plate in the transverse direction of the cloth to be tucked, said upper and lower spatulas being arranged one above the other in a position parallel to said first and second pressers and being movable up and down so as to be brought into and out of engagement with each other, a width setting bar mounted on the slider for backward and forward movement relative to the working position of the working plate in the transverse direction, and a tucking plate pivotably connected to the slider so as to be inserted between the upper and lower spatulas when the spatulas are moved away from each other.

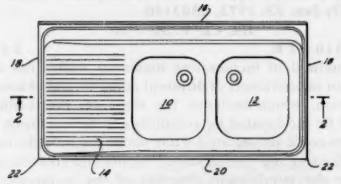
3,918,377

ARTICLE OF MANUFACTURE AND MANUFACTURING OF SUCH ARTICLE

Werner R. Herbold, Oberderdingen, Germany, assignor to Blanc & Co., Oberderingen, Germany

Division of Ser. No. 200,128, Nov. 19, 1971, Pat. No. 3,774,561. This application Oct. 15, 1973, Ser. No. 406,398
Claims priority, application Germany, Nov. 21, 1970, 2057339The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.² B21D *51/18*
U.S. Cl. 113—120 B **6 Claims**

1. A method of making a sink unit having a pair of laterally adjacent basins and a work surface laterally adjacent one of said basins, comprising the steps of tightly engaging a sheet of stainless steel along transversely spaced parallel lines between which an area of the sheet is to be deep-drawn to form said pair of basins, but which lines have a length less that the distance between the loci where the outermost corners of the basins are to be located; tightly engaging said sheet along an additional line extending transversely to said parallel lines, at a side of said area which is remote from said work surface but



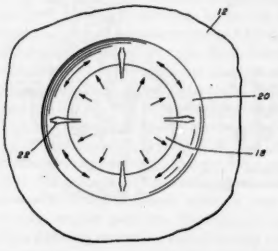
which terminates short of said parallel lines; less tightly engaging said sheet outside the region defined by said parallel and transverse lines for shaping said work surface; and deep-drawing said sheet intermediate said lines several times for each sink unit to be formed, whereby to produce said basins in, and shape said work surface on said sheet.

3,918,378

CONTAINER CLOSURE WITH VENT OPENING MEANS AND METHOD OF FORMING THE SAME

Robert G. Clawson, Pershing, and Wilburn C. Willis, Richmond, both of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 281,715, Aug. 18, 1972, Pat. No. 3,851,782. This application July 17, 1974, Ser. No. 489,257
Int. Cl.² B21D *51/26*
U.S. Cl. 113—121 C **3 Claims**



1. A method of forming a vent opening in sheet metal wall for a container comprising the steps of:

cutting at least one score line part way through the sheet metal of the wall;

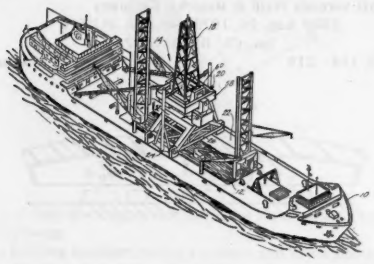
supporting the metal wall against a die having a generally hemispherically shaped support convex toward the wall with an annular groove therearound open toward the wall, and with the wall positioned with the score line extending in the wall radially overlying the outer portion of the support; and

drawing the metal wall against the support and into the groove therearound to form a generally hemispherically shaped embossment in the wall with an annular wall portion around the embossment forming a groove with the outer portion of the embossment, and with the score line extending radially in the outer portion of the embossment.

3,918,379
GIMBAL SUPPORT SYSTEM FOR DEEP OCEAN MINING VESSEL

James F. McNary, Pacific Palisades; Edward C. Hicks, Santa Ana, and Yilmaz H. Ozudogru, Los Angeles, all of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed June 13, 1974, Ser. No. 479,155
Int. Cl.[2] B63B *35/44*, *35/00*
U.S. Cl. 114—.5 D 8 Claims



1. In a deep ocean mining vessel or the like, a gimbal system to provide a stable base for a derrick, comprising a pair of spaced vertical guide frames mounted on the vessel, a pair of gimbal support members movable vertically on the respective guide frames, heave control means controlling the position and movement of the gimbal support members relative to the guide frames, a gimbal frame, means rotatably supporting the gimbal frame on the gimbal support members for rotation about a first axis of rotation, a platform, means rotatably supporting the platform on the gimbal frame for rotation about a second axis of rotation substantially perpendicular to the first axis of rotation, means for controlling the rotation of the platform about the second axis including a plurality of hydraulic linear actuator means, a plurality of variable length snubbing members mounted on the gimbal frame, the snubbing members when extended engaging the platform at widely spaced points on either side of the second axis, the snubbing members being variable in length in a direction substantially parallel to the direction of movement of the platform relative to the snubbing members, whereby changing the length of the snubbers controls the limits of rotational movement of the platform about the second axis.

3,918,380
CLOSABLE WELL IN HULL OF DEEP OCEAN MINING VESSEL

John R. Graham, Newport Beach, and Robert C. Crooke, Corona Del Mar, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

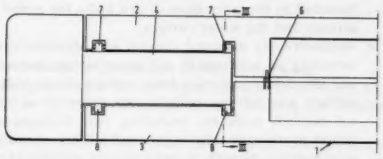
Filed June 13, 1974, Ser. No. 479,097
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—0.5 D 7 Claims

1. A vessel comprising a hull, an open well extending vertically through the hull, and gate means for opening and closing the bottom of the well, said means including means for sealing off the bottom of the well when the gate means is closed, said means for opening and closing the well including means slidably supporting the gate means for movement horizontally beneath the hull, the sealing means including means increasing the buoyancy of the gate means to cause the gate means to rise into firm sealing engagement with the hull, and means for decreasing the buoyancy to cause the gate means to fall away from the hull and permit the gate means to be moved horizontally relative to the hull.

3,918,381
BOTTOM-DUMP VESSELS

Bartele van der Werff, Medemblik, Netherlands, assignor to A Vuyk & Zonen's Scheepsverven B.V., Ijssel, Netherlands

Filed Mar. 27, 1974, Ser. No. 455,282
Claims priority, application Netherlands, Mar. 29, 1973, 7304384
Int. Cl.[2] B63B *35/30*
U.S. Cl. 114—29 3 Claims

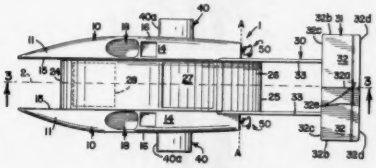


1. A bottom-dump vessel comprising two longitudinal hull sections forming pontoons hinged together pivotably about a first longitudinal pivot axis, and at least one intermediate hull section, arranged at least partially in a recess between said two longitudinal hull sections at the end thereof, said longitudinal hull sections being pivotable between open and closed positions of the vessel, means for connecting said intermediate hull section to each of said longitudinal hull sections for hinging movement about a second and a third longitudinal pivot axis, wherein during the pivoting movements of the longitudinal hull sections between open and closed positions of the vessel said first pivot axis passes the plane containing said second and said third pivot axis.

3,918,382
FIXED WING SURFACE EFFECT CRAFT

Thomas M. Austin, Fargo, N. Dak., assignor to Austin Aeromarine, Inc., Fargo, N. Dak.

Filed June 24, 1974, Ser. No. 482,342
Int. Cl.[2] B63B *1/38*
U.S. Cl. 114—66.5 R 14 Claims



1. A fixed wing surface effect craft for travel on water, said craft being generally symmetrical about a longitudinal vertical plane along its centerline and being described in part by a craft center of gravity, comprising:

a. two symmetrically disposed streamlined hulls for supporting the craft on water, said hulls including a tapered front portion, a back end, a bottom surface, an outer side and a inner side; said hull bottom surface having a supporting back portion which generally contacts the water when the craft is propelled therethrough and which serves as a point of support for the craft; a line extending between two opposed points, each located on said hull back ends where the hull outer side and bottom surface meet, defining a hull baseline positioned adjacent said bottom sur-

face supporting portion, and having a length referred to as the craft beam;

b. an airfoil laterally disposed between said hulls to provide aerodynamic lift for raising the craft onto the water surface;

c. said airfoil having a leading edge, a trailing edge and a bottom surface; said airfoil fixedly oriented between the inner sides of said hulls to provide a positive angle of incidence between the airfoil and the water surface when the craft is moving forward;

d. said airfoil oriented on the craft with its bottom surface located above the bottom surface of said hulls to form a Venturi-shaped chamber beneath the craft for creating an air cushion that partially supports the craft and allows a major portion of the bottom surface of said hulls to rise out of the water as the craft moves foward, said chamber bounded by the inner sides of said hulls, the airfoil bottom surface and the water surface;

e. symmetrically disposed control and stabilization means including an inverted-V tail assembly positioned above and aft of the supporting back portion of said hull bottom surface; said tail assembly being comprised of non-vertical control surfaces, including two inclined surfaces joined at an apex edge with each surface sloping downwardly and outwardly therefrom to an outboard edge, and means for attaching said tail assembly to said hulls;

f. said control and stabilization means further including a control flap formed from at least a portion of the trailing edge of said airfoil, said flap pivotally mounted for controlled selective positioning to vary the aerodynamic characteristics of said airfoil and to vary the airflow characteristics in said Venturi chamber to partially control the lifting force imparted to the craft therefrom; and

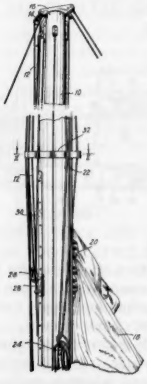
g. stowage means for placement of personnel and cargo on the craft.

3,918,383

ANTI-NOISE DEVICE FOR THE MASTS OF SAILING VESSELS AND THE LIKE AND METHODS FOR PREVENTING NOISE

Richard Brown, 118 Sequams Lane Center, West Islip, N.Y. 11795

Filed Apr. 18, 1974, Ser. No. 462,047
Int. Cl.² B63H 9/04
U.S. Cl. 114—102 **15 Claims**



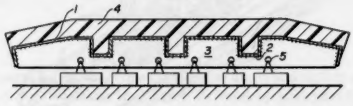
1. A sailing vessel comprising a mast, a plurality of lines running along said mast to control the positions of sails relative thereto, and anti-noise means provided with an opening and located between the mast and lines to triangulate the latter and take up slack in the same with the sails lowered whereby to prevent the lines from slapping against the mast, said lines peripherally engaging said means without connection thereto whereby to facilitate mounting said means on said mast and dismounting said means from the mast, said anti-noise means being at least in part readily detachable by way of said opening radially from and relative to said mast to permit the raising and lowering of said sails.

3,918,384

FENDER

Werner Blöse, Hamburg, Germany, assignor to Schlegel GmbH vormals Weill & Reineke, Germany

Filed Aug. 20, 1973, Ser. No. 392,610
Int. Cl.² B63B 59/02
U.S. Cl. 114—219 **6 Claims**



1. A fender comprising:

a. a structurally rigid, metal carrier body;

b. a pad secured to said carrier body and oriented to be engaged by a vessel;

c. said pad being a solid, essentially homogeneous body of plastics material consisting of at least 80% of polyolefins;

d. the surface of said pad to be engaged by said vessel being generally smooth and having a relatively low coefficient of friction, said low coefficient of friction being low enough for the side of said vessel to slide freely along said pad even when forcefully pressed against said pad; and

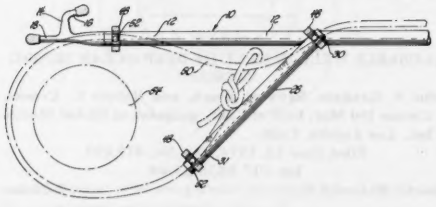
e. said pad having a hardness of at least Shore D40.

3,918,385

MOORING DEVICE

Goerge T. Wallace, 4305 W. Thirteen Mile Road, Royal Oak, Mich. 48072

Filed Oct. 21, 1974, Ser. No. 516,742
Int. Cl.² B63B 21/54
U.S. Cl. 114—230 **8 Claims**

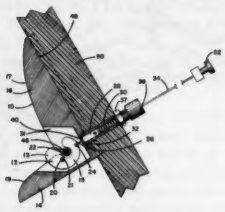


1. A mooring device comprising: a straight, elongated pole member having a handle end and a free end, an arm member having an attached end pivotally connected to said pole member near said free end thereof and a second end spaced from said attached end wherein said arm member is movable between a stowed position adjacent and generally parallel to said pole member and an extended position wherein said second end is disposed laterally from said pole member and forms therewith an open bifurcation with said free end of said pole member, and rope supporting means on said arm member and said pole member for temporarily supporting a rope; said rope supporting means on said pole member and said arm member all lying along a straight line which generally parallels said pole member when said arm member is in the stowed position.

3,918,386
BOAT DOCKING DEVICE

Furman D. McClain, 4733 Rochell Ave., Las Vegas, Nev. 89121

Filed Sept. 23, 1974, Ser. No. 508,241
Int. Cl.² B63B 21/04
U.S. Cl. 114—230 14 Claims

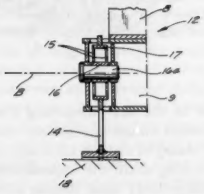


1. A boat docking device for being mounted on a boat bow comprising:
- a housing member having an upper and lower portion each having a forward surface slanting inwardly to a slot for receiving a mooring line;
- a locking member pivotally mounted in said housing member between a locked and unlocked position having a finger portion at one end thereof for closing said slot in a locked position, a surface exposed in said slot in an unlocked position, said locking member pivoting to a locked position when pressure is exerted against said exposed surface in the direction of said bow and to an unlocked position when pressure is exerted against said finger in the direction away from said bow;
- a locking notch on said locking member;
- a retractable biased pin extending into said housing member, urged against said locking member and received in said notch when said locking member is in a locked position; and
- means for retracting said pin from said notch.

3,918,387
DRIVE SYSTEM

Wilhelm Jobst, Bremen, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

Filed June 13, 1974, Ser. No. 479,147
Claims priority, application Germany, June 16, 1973, 2330832
Int. Cl.² B63H 23/32
U.S. Cl. 115—.5 B 10 Claims

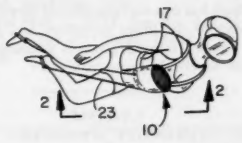


1. In a ship drive system wherein the base for the drive unit is subjected to flexural deformation due to the operation of the ship, a combination comprising a drive unit having a housing and an output shaft which extends from said housing and is rotatable about a first axis; a pair of resilient transversely spaced supports engaging and supporting said housing and yieldable in the longitudinal direction of a second axis which crosses said first axis; and resilient connecting means connecting said housing with said supports for pivotal yielding about said second axis.

3,918,388
SUBMERGED PROPULSION DEVICE

Rodolphe J. Bernard, 17621 Irvine Blvd., Suite 101, Tustin, Calif. 92680

Filed June 10, 1974, Ser. No. 477,794
Int. Cl.² B63H 16/00
U.S. Cl. 115—22.2 6 Claims

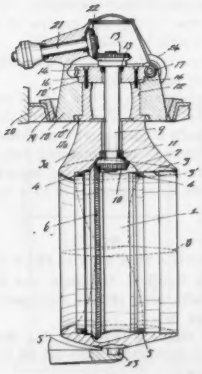


1. A submergible propulsion device comprising:
- a housing having a forward open end and an aft open end;
- a drum operably mounted in said housing for rotation therein;
- a flexible cord attached to said drum for movement thereof, each end of said cord passes through said housing and extends rearwardly thereof;
- means attached to each end of said cord for removably receiving a corresponding foot of the user thereof;
- teeth means axially opposed to each other on opposite edges of the circumference of said drum;
- gear means positioned between said teeth means for alternating engagement therewith;
- a shaft operably mounted in said housing having one end thereof connected to said gear means; and
- a propeller attached to the other end of said shaft adjacent the aft open end of the housing.

3,918,389
MARINE STEERING AND PROPULSION DEVICE

Kiyoshi Shima, 14-2 Tsujido Shin-Machi 1-Chome, Fujisawa, Kanagawa, Japan

Filed Nov. 26, 1974, Ser. No. 527,504
Int. Cl.² B63H 1/12, 5/14; F16H 55/04
U.S. Cl. 115—34 B 2 Claims



1. A marine steering and propulsion device comprising a hollow jet cylinder having horizontal vanes provided on and extending outwardly from the diametrically opposite positions of the outer periphery of said cylinder in the opposite directions, a rotary turbine casing journalled in said jet casing and having a larger bevel gear extending about the outer periphery of said turbine casing, a Kaplan turbine received within said turbine casing for rotation together with the casing with the

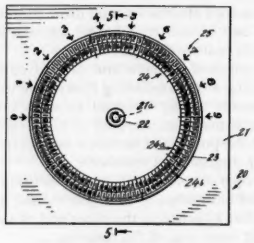
axis of the turbine intersecting the vertical center line of said jet cylinder at right angles, upper and lower bearing means for rotatably supporting said jet cylinder and a vertical propulsion shaft extending through said upper bearing into said jet cylinder and having at the lower end a smaller bevel gear in meshing with said larger bevel gear on the turbine casing whereby the rotation of said propulsion shaft rotates said Kaplan turbine within said jet cylinder to provide propulsion jets, the said larger bevel gear on the turbine casing comprises an annular metal disc which has one surface sloping downwardly from the outer periphery to the inner periphery and provided with a plurality of equally spaced grooves extending radially and inserting teeth received in said grooves.

3,918,390

VERSATILE BOOKMARK

Joseph Bosco, 31 Summer St., Everett, Mass. 02149

Filed Oct. 7, 1970, Ser. No. 78,804
Int. Cl.² B42D *9/00*
U.S. Cl. 116—119 **2 Claims**



1. In a device of the class described for registering pages 1 through 999 of a book comprising in combination:

a. a circular rotatable dial mounted for rotation on an outer stationary plate;

b. two rows of indicia numerals printed on the outer circumference of said rotatable dial;

c. said outer row including ten groups of numbers beginning with zero and ending with nine in a series, each group consisting of ten of each number;

d. said inner row having ten groups of numerals running from zero to nine in series;

e. said first zero of the outer row being aligned radially with a first zero of said inner row;

f. said stationary plate having a row of numbers from zero to nine printed thereon circumferentially of said rotatable dial and radially alignable with said numbers on said first and second rows of said rotatable dial;

g. said numbers on said plate being spaced at least over one quarter of the circumference of said rotatable dial.

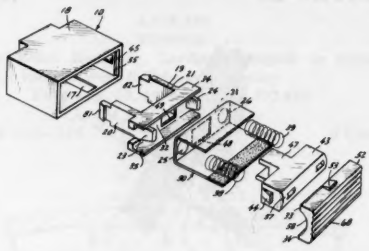
3,918,391

MODE INDICATOR FOR SLIDER ELEMENT

Raymond George Hadfield, Glendale, and Kenneth Lee Roy, Menomonee Falls, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed May 13, 1974, Ser. No. 469,227
Int. Cl.² G08B *5/00;* **H01H** *9/16*
U.S. Cl. 116—124 L **14 Claims**

1. A mode indicating button for a slider element movably mounted in a body member lining a smooth concave surface comprising a housing element for attachment to and movement with said slider element, a lens member disposed in said housing element, a holder member positioned inside said housing element and supported from said body member in a stationary manner, flexible sheet mode indicating means secured to said holder member and extending adjacent the concave surface of said lens member, biasing means for securing said flexible sheet mode indicating means between said holder member and said lens member, means defining a guide path for a portion of said flexible sheet mode indicating means adjacent the concave surface of said lens member whereby movement of said housing element toward and away from said holder member effects movement of said slider element and



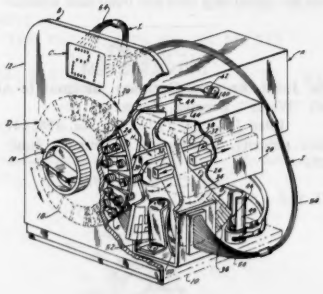
of said flexible sheet mode indicating means inside said guide-path, said means defining a guide path comprising a spring holding member which is spring biased from said mode indicating means holder member, said spring holding member presenting a smooth convex surface and said lens smooth concave surface being complementary thereto with a portion of said flexible sheet disposed therebetween.

3,918,392

PROGRAMMABLE FIBER OPTIC DISPLAY FOR USE IN TELEVISION TUNERS

Richard D. Gibson, Wilbraham, and Robert D. Whelan, West Springfield, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed Feb. 22, 1974, Ser. No. 444,821
Int. Cl.² H03J *1/04*
U.S. Cl. 116—124.4 **24 Claims**



1. In a TV tuner or the like comprising a movable tuning shaft and tuning control means operatively connected thereto for controlling the tuning of the TV set in accordance with the movement of the tuning shaft; the improvement which comprises a programmable fiber optic display comprising a support having a display station, and a movable body having a set of position adjustable elements thereon, said body being operatively connected to said shaft to be driven thereby, a movable display element having a plurality of indicia spaced thereover, drive means operatively connected to said display element independently of said tuning control means and positioned to sequentially contact each of said position adjustable elements as said body is moved, said drive means being effective to move said display element to various operative positions in accordance with the position of the position adjustable element contacting said drive means, fiber optic means for opti-

cally connecting said display element and said display station, and means for illuminating said display element, said display element being effective to mask selected portions of said fiber optic means, such that selected areas of said display station corresponding to the then operative position of said display element are illuminated.

3,918,393

METHOD OF PRODUCING FLAT (NON-GLOSSY) FILMS

Ernest A. Hahn, Plainfield, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 10, 1971, Ser. No. 179,564

Int. Cl. B44d *1/50;* **C08f** *3/42, 3/50*

U.S. Cl. 427—38 **15 Claims**

1. The method of obtaining a strong, non-glossy film comprising subjecting substantially solventless, radiation-sensitive or actinic light sensitive material to ionizing irradiation or actinic light in an atmosphere containing at least about 5,000 parts per million of oxygen until the material is cured except for its surface, and subsequently subjecting the material to ionizing irradiation or actinic light in an inert atmosphere containing less than about 1000 parts per million of oxygen.

3,918,394

MACHINE FOR CEMENT LASTING

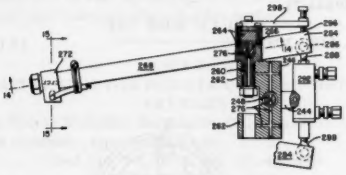
Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Division of Ser. No. 386,129, Aug. 6, 1973, Pat. No. 3,831,216.

This application Jan. 2, 1974, Ser. No. 430,291

Int. Cl.² B05C *5/02*

U.S. Cl. 118—7 **3 Claims**



1. A cement applying mechanism comprising: support means for supporting bottom - up a shoe assembly that includes a last having an insole located on its bottom and an upper mounted thereon, at least one end portion of the margin of the upper having been wiped against the insole and an unwiped portion of the upper margin extending rearwardly of said wiped end portion and extending upwardly of the corresponding portion of the insole periphery; a nozzle, located above the shoe assembly, mounted for forward - rearward movement; yieldable drive means connected to the nozzle and actuable to effect said forward - rearward movement; cement extruding means actuable to extrude cement through the nozzle; means for initially locating the nozzle with the cement extruding means in unactuated condition in a starting position in the corner between said unwiped margin portion and the corresponding portion or the insole periphery a particular distance rearwardly of the boundary between said wiped and unwiped margin portions release means actuable to thereafter enable the yieldable drive means to move the nozzle forwardly while the nozzle stays in said corner with the cement extruding means remaining in unactuated condition until the nozzle forward movement is arrested due to the arrival of the nozzle at said boundary; reversing means actuable to cause the drive means to thereafter move the nozzle rearwardly while the nozzle stays in said corner until the nozzle arrives at a desired location along said unwiped margin portion; means for actuating said reversing means a predetermined time after the actuation of said release means which time is not less than the time required for the nozzle to move through said particular distance; and means for actuating the cement extruding means during substantially the entire rearward movement of the nozzle to cause cement to be extruded through the nozzle into said corner during substantially the entire rearward movement of the nozzle.

3,918,395

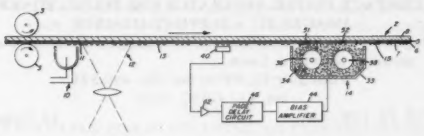
CONTINUOUS BIAS CONTROL FOR ELECTROGRAPHIC DEVELOPMENT APPARATUS

William T. Fearnside, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,717

Int. Cl.² G03G *15/08*

U.S. Cl. 118—8 **9 Claims**



1. In electrographic apparatus of the type including a development station and means for advancing a surface bearing an electrostatic charge pattern along a predetermined path past the development station and in which said development station includes at least two magnetic brushes arranged to continuously contact the surface as it moves therepast and means for applying an electrical potential to said brushes, the improvement comprising:

means for instantaneously varying the electrical potential applied to said brushes to correspond uniquely to the charge characteristics of the individual charge pattern portion instantaneously passing the last contact area between the magnetic brushes and the surface.

3,918,396

CONTAINER FOR THE PRODUCTION OF SEMICONDUCTOR BODIES

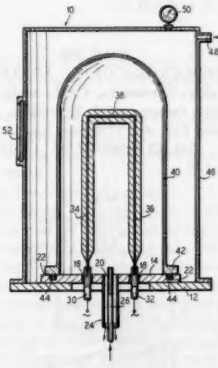
Wolfgang Dietze, Munich, and Herbert Sandmann, Vaterstetten, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 4, 1974, Ser. No. 447,721

Claims priority, application Germany, May 14, 1973, 2324365

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49.1 **6 Claims**



1. An apparatus for the deposition of semiconductor material from a gaseous compound onto a workpiece, comprising a base plate having means to support at least one workpiece thereon, including means to heat the workpiece,

a dome covering a portion of said base plate and the means supporting the workpiece,

an outer container mounted on said base plate and enclosing said dome to define a closed pressure chamber therewith,

gas inlet means connected to said outer container for introducing a gas under pressure into said pressure chamber defined by said dome and outer container,

whereby when gas under pressure is introduced into said pressure chamber said dome is positively sealed onto said base plate.

3,918,397

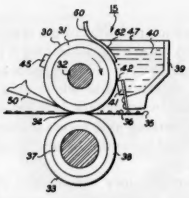
CONTACT FUSING APPARATUS FOR FIXING TONER IMAGES TO A SUPPORT MEMBER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 22, 1974, Ser. No. 490,521

Int. Cl.² G03G *15/20*

U.S. Cl. 118—60 **14 Claims**



1. Contact fuser apparatus for fixing toner images to support sheets, said apparatus comprising:

a fuser roll structure having a rigid, thermally conductive outer surface;

a resilient backup roll forming a nip with said fuser roll structure through which said support sheets move with said toner images contacting said fuser roll structure;

means adapted to chemically react with said surface to form a thin toner impenetrable layer thereon;

a sump containing a quantity of said chemically reacting material;

means supporting said sump adjacent said fuser roll structure such that said surface contacts said chemically reacting material; and

means for preventing direct contact of said chemically reacting material with said surface and simultaneous exposure to ambient air.

3,918,398

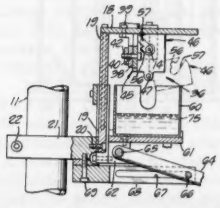
CONDUCTOR CODING APPARATUS

Kenneth D. Palcic, Escondido, Calif., assignor to Formulabs Industrial Inks, Incorporated, Escondido, Calif.

Filed Feb. 4, 1974, Ser. No. 439,925

Int. Cl.² B05C *1/06, 11/02*

U.S. Cl. 118—125 **12 Claims**



1. That improvement in apparatus for coding an electrical conductor with a permanent coding ink while being passed axially past said coding apparatus, said apparatus being of the type having a pair of spaced-apart axially-aligned conductor guide means for holding a length of the conductor straight and unbent while passing between said pair of conductor guide means, a coding ink supply reservoir adjacent said conductor guide means having its ink surface level below the area of ink application to a conductor undergoing coding, said improvement comprising: ink applicator means embracing the conductor undergoing coding in an area thereof intermediate said pair of conductor guide means, said ink applicator means including at least one pair of normally stationary rigid channel-shaped members facing toward one another from opposed sides of a conductor each supporting ink-feeding wick means arranged to be supplied with ink from said ink supply reservoir, means supporting said channel-shaped holders for relative movement toward and away from one another between first and second positions, said wick means being in contact with the conductor and effective to apply ink thereto when said pair of holders is in said first position, and said pair of wick holders including means automatically effective to shift the conductor laterally out of contact with each of said wick means when said holders are moved away from said first position to said second position and for automatically returning the conductor into contact with said wick means when said holders are restored to said first position.

3,918,399

SPREADING OF PARTICULATE MATTER

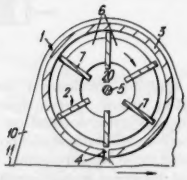
John Cuthbert Fox; Martin Richard Winterbottom, and Michael Frank Culpin, all of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 24, 1972, Ser. No. 283,289

Claims priority, application United Kingdom, Aug. 25, 1971, 39841/71

Int. Cl.² B05B *7/14*

U.S. Cl. 118—308 **13 Claims**



1. Apparatus for the uniform distribution of particulate matter on to a substrate advancing at a uniform rate, comprising an elongated hollow cylinder provided with a slot extending along its effective length; a member located coaxially within the cylinder and rotatable about its lengthwise axis, said member comprising support means extending beyond the ends of said hollow cylinder and having mounted therebetween a plurality of vanes disposed within said hollow cylinder, each of said vanes extending along the entire effective length of said hollow cylinder, the outer edges of said vanes being adjacent but not touching the inner wall of said cylinder, said vanes having radially measured dimensions less than the internal radius of the hollow cylinder to define a central, cylindrical channel within said member; means for supplying particulate matter suspended in a turbulent stream of gaseous fluid at a constant rate to said channel defined within said member; means for axially rotating said member at a uniform rate; and means for advancing a substrate perpendicular to said slot in said hollow cylinder, the slot in said hollow cylinder and said rotatable member each having a length sufficient to enable uniform distribution of particulate matter onto a substrate having a width in the range of 1 meter and above.

3,918,400
BLADE MOUNTING ASSEMBLIES

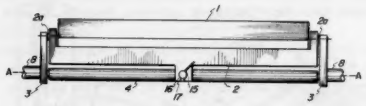
Robert A. Cheeseman, Hitchin, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 20, 1974, Ser. No. 471,625

Claims priority, application United Kingdom, June 23, 1973, 30008/73

Int. Cl.² B05C *1/06*

U.S. Cl. 118—261 **12 Claims**



1. An apparatus for urging a blade against a substantially inflexible surface comprising

a blade mounting assembly having a pair of pivot arms independently mounted for pivotal movement about a common pivot axis and a blade holder movably coupled at opposite ends to the respective pivot arms at locations remote from the pivot axis, the blade holder being capable of movement independent of the pivotal movement of the pivot arms;

means independently biasing the pivot arms to urge a blade in the blade holder towards a said substantially inflexible surface; and

restraining means for limiting movement of the blade holder with respect to the pivot arms, the couplings between the blade holder and the pivot arms being sufficiently movable to permit small relative movements of the arms sufficient to take up misalignment between the pivot axis and such substantially inflexible surface.

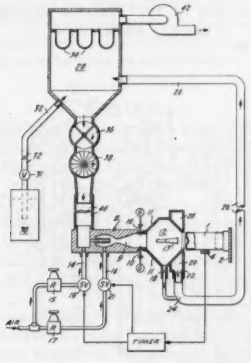
3,918,401
APPARATUS FOR POWDER COATING METAL ARTICLES

Harry Nelson Blakeslee, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 17, 1974, Ser. No. 461,696

Int. Cl.² B05B *5/02, 7/14*

U.S. Cl. 118—630 **9 Claims**



9. An apparatus for electrostatically and selectively coating ends of a metal container which comprises, in combination:

A. a spray device comprising a spray chamber and having means for electrically charging and spraying particles of powder upon the end of a container positioned at the orifice of said chamber;

B. a mask chamber having an air current disposed between the orifice and the container which shields the sidewalls of the container from contact with said particles;

C. a vacuum manifold connected to said spray chamber through a low pressure vacuum port and to said mask chamber through a high pressure vacuum port for withdrawing air and excess powdered material;

D. a powder supply chamber connected to said spray device and said vacuum manifold comprising

1. means for supplying new powdered material for admixture with withdrawn material;

2. means for reconditioning said powdered material

3. means for feeding reconditioned powdered material to said spray device and

E. a blower creating an air current which exhausts air from each of said spray chamber, mask chamber, vacuum manifold and powder supply chamber.

3,918,402
APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE IN ELECTROPHOTOGRAPHY WITH A DRY DEVELOPING AGENT

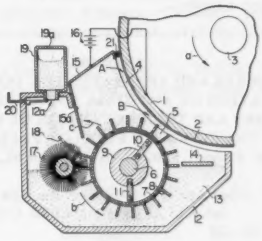
Wasaburo Ohta, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 18, 1973, Ser. No. 398,548

Claims priority, application Japan, Sept. 25, 1972, 47-95892

Int. Cl.² G03G *15/08*

U.S. Cl. 118—637 **8 Claims**



1. An electrophotographic apparatus for developing an electrostatic latent image with a dry developing agent comprising:

a. a movable member having an electrostatic latent image formed on the surface thereof;

b. a brush developing section containing a brush developing means comprising:

i. a supply of developing agent; and

ii. a rotatable brush roller disposed in said supply and adjacent the path of movement of the surface of said movable member for applying said developing agent from said supply to said electrostatic latent image; and

c. a powder cloud forming section disposed adjacent said brush developing section upstream along the path of movement of the surface of said movable member and comprising powder cloud forming means for removing the developing agent from said rotating brush roller and scattering it to form a powder cloud for developing said electrostatic latent image,

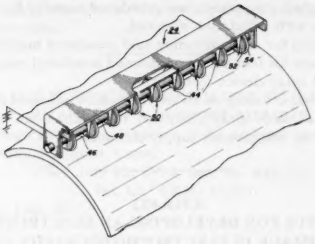
such that the electrostatic latent image is developed into a visible image by powder cloud developing and brush developing to which it is subjected consecutively.

3,918,403

CORONA TRANSFER MECHANISM

Richard C. Vock, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,539
Int. Cl.² B05B 5/02
U.S. Cl. 118—637 **2 Claims**



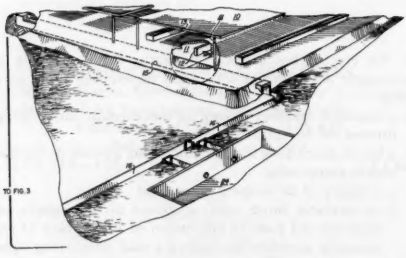
1. An improved apparatus for effecting transfer of a developed electrostatic image from a first support member to a second support member, the apparatus comprising a plurality of spaced point discharge needles disposed adjacent to the first support member, and a plurality of rollers disposed among the needles, the rollers being mounted in contact with the first support member and mounted for rotation around a common axis whereby the rollers keep the first support member and the second support member in contact with each other during transfer.

3,918,404

PROCESS AND APPARATUS FOR INHIBITING GENERATION OF AMMONIA AND OTHER NOXIOUS GASES AND THE PREVENTION OF ODOR IN CONCENTRATED FEEDLOT FACILITIES

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85018

Filed Apr. 11, 1974, Ser. No. 459,905
Int. Cl.² A01K 1/00; C02B 1/18
U.S. Cl. 119—28 **21 Claims**



1. A process for inhibiting the generation of ammonia from animal excreta through the control of the pH level of the excreta under the animal in a feedlot comprising the steps of:

collecting the exereta underneath the animal in a feedlot;

diluting the excreta with a chemical additive to control the pH rating of the excreta,

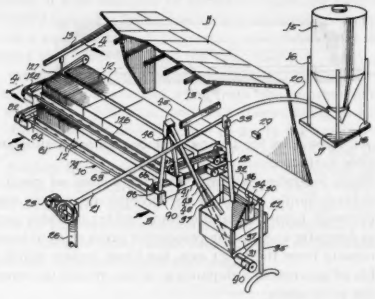
periodically removing a part of the excreta from underneath the animal while maintaining said control of the pH rating of the excreta.

3,918,405

WEIGHT-CONTROLLED RECIRCULATING FEEDING APPARATUS AND METHOD

Eldon Hostetler, Middlebury, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Jan. 14, 1974, Ser. No. 433,222
Int. Cl.² A01K 5/02
U.S. Cl. 119—52 AF **23 Claims**



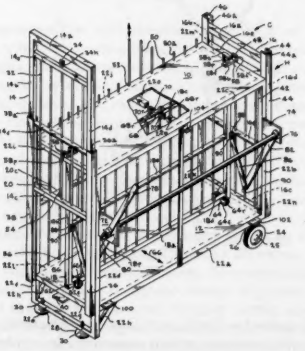
1. A feeding system for poultry and the like, comprising feed weighing means for receiving and weighing a measure of feed from a remote supply, and feed recirculating means operatively connected to the feed weighing means and having an upstream receiving point for receiving feed from the weighing means at said point, the recirculating means including a first feed line for presenting feed to poultry in a manner permitting consumption of the feed by the poultry, means for urging the feed from the upstream receiving point to a downstream point and feed return means interconnected between the downstream point and the recirculating means upstream receiving point for returning unconsumed feed from the downstream point to the upstream receiving point.

3,918,406

CAGE APPARATUS

Carol M. Patterson, Houston, Tex., assignor to Research Equipment Company, Inc., Bryan, Tex.

Filed May 13, 1974, Ser. No. 469,545
Int. Cl.² A01K 29/00
U.S. Cl. 119—96 **9 Claims**



1. A cage apparatus for housing animals such as felines, comprising:

a housing including a top, a bottom, a front wall, a rear wall, a momvable slide wall, and a fixed side wall, providing an enclosed area for confining such felines;

roller means mounted with said movable side wall, for supporting same for movement within said housing;

restraint means connected with said movable side wall for moving said movable side wall toward said fixed side wall for restraining such animal within said housing;

locking means for locking said movable side wall in various fixed positions with respect to said fixed side wall;

a central support member mounted with said top of said housing; and

a roller assembly mounted with said movable side wall for engaging said central support to position and support said movable side wall in an aligned and upright position.

3,918,407

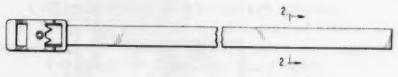
PET COLLAR

Jack Greenberg, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Nov. 20, 1973, Ser. No. 417,704

Int. Cl.² A01K *27/00*

U.S. Cl. 119—156 **10 Claims**



1. A flea control collar for a warm blooded animal comprising:

a strip of flexible synthetic resin material containing between about 5 and 25 wt. percent naled and having a width, thickness and length sufficient to encircle the neck of the animal with clamping means at one end of the collars for engaging a spaced collar portion to prevent loss of the collar from the neck of the wearing animal; said strip being formed from a dispersion of a synthetic resin, naled and a surface porosity control component that is non-reactive in the dispersion and has a boiling point at or below the curing temperature of said resin, said dispersion being heated to its curing temperature to produce surface openings in communication with pores in said strip by vaporization of said porosity control component to provide for release of naled gas at a rate effective to control fleas on said animal throughout a period of at least about 90 days, but insufficient to form as droplets on the strip or to be toxic to said animal.

3,918,408

RUBBING AND LIQUID APPLYING APPARATUS

George W. Keene, P.O. Box 395, Rochelle, Ill. 61068

Filed July 12, 1974, Ser. No. 488,173

Int. Cl.² A01K *29/00*

U.S. Cl. 119—157 **14 Claims**

1. A rubbing and liquid applying apparatus for livestock, comprising, in combination:

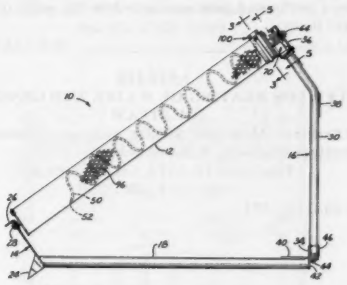
an elongated cylinder having upper and lower end walls, said cylinder defining a reservoir for holding liquid therein;

frame means for supporting said cylinder at an inclined angle and adapted to permit rotation of said cylinder;

a spiral tube positioned in said cylinder and adapted to deliver liquid from the lower end thereof through a first aperture at the upper end portion adjacent the upper end portion of said cylinder in response to rotation of said cylinder in a predetermined direction;

means for limiting rotation of said cylinder to said predetermined direction;

said cylinder having a second aperture located at the upper end thereof for delivering liquid to the outer surface thereof, the first aperture of said spiral tube being adjacent said second aperture and adapted to communicate liquid from said spiral tube to the outside of said cylinder, said first aperture being in the side of said spiral tube and having its lower side abutting said cylinder side wall to present a smooth path for liquid to run to the outside of



the cylinder, the upper side of said aperture being spaced a sufficient distance from the inside of the cylinder to permit liquid to return to said reservoir; and,

flow control means positioned on the cylinder adjacent said second aperture for regulating the flow of liquid therethrough and for uniformly distributing said liquid around the circumference of said cylinder.

3,918,409

STEAM GENERATOR

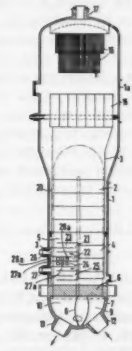
Heinz-Jurgen Schroder, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 12, 1974, Ser. No. 505,383

Claims priority, application Germany, Sept. 14, 1973, 2346411

Int. Cl.² F23G *1/06*

U.S. Cl. 122—32 **7 Claims**



1. A steam generator comprising a housing, a tube plate closing the bottom of said housing, a tube bundle mounted in said tube plate, a shroud surrounding at least a portion of said tube bundle adjacent to said tube plate and spaced inwardly from said housing, a space being formed between said shroud and said housing, walls inside of said shroud and with the latter forming a feed-water preheater having an outlet to said housing, a feed-water plenum chamber extending transversely along the outside of said shroud in said space and having an inlet opening, and a feed-water inlet nozzle for said housing

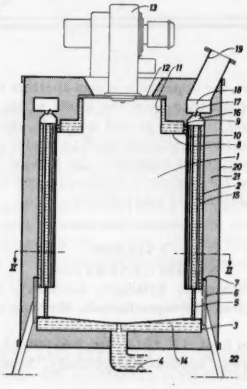
and having an inner end registered with and connected with said inlet opening, said nozzle directing a feed-water jet against a portion of said shroud for deflection thereby to form deflected flows throughout said plenum chamber and said shroud having a series of inlet holes formed therethrough from said plenum chamber and all of which are offset from the chamber's said inlet opening; wherein the improvement comprises a perforated plate positioned in the paths of said deflected flows.

3,918,410

BOILER FOR HEATING OF WATER AND GENERATING OF STEAM

Rolf Backman, Molnlycke, Sweden, assignor to Handelsbolaget Broderna Backman, Kallered, Sweden

Filed June 19, 1974, Ser. No. 480,857
Int. Cl.² F22B *25/00*
U.S. Cl. 122—271 **5 Claims**



1. A boiler comprising: a furnace, a first water tank to be charged with water to be heated, a second water tank from which heated water is to be discharged, a plurality of water tubes connecting said first and second water tank and being arranged parallel to each other, with adjacent tubes being joined together to form a jacket encircling said furnace and forming its outer wall, a plurality of fire tubes provided within said water tubes for passing combustion gases from said furnace therethrough, a gas collecting chamber connected to said fire tubes for receiving the combustion gases therefrom, the arrangement being such that said water tubes are subjected to combustion gases only on the surface thereof facing said furnace.

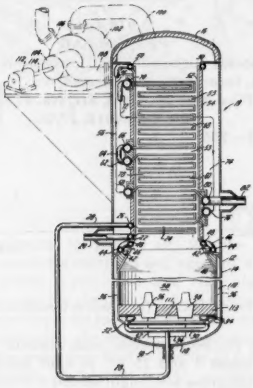
3,918,411

SUPERCHARGED BOILER

Walter Wolowodiuk, New Providence, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 28, 1974, Ser. No. 501,408
Int. Cl.² F22G *7/12*; F22B *33/18*
U.S. Cl. 122—477 **4 Claims**

1. A supercharged steam generator comprising:
a generally cylindrical pressure vessel having a top closure and a bottom closure;
a gas outlet in said top closure;
a plurality of vertically extending evaporator tubes defining the wall of a furnace section within and at the lower portion of said pressure vessel for flowing water to be heated to steam;
a convection section within said pressure vessel directly above said furnace section;
a first annular air space between said convection section and said pressure vessel;
a second annular space between said convection section and said pressure vessel;
said first, and second air spaces being sealed from said furnace section and said convection section;
a supercharger comprising:
a drive motor;
a turbine; and
a compressor; said compressor being drivable by
said turbine and said motor;
and an air duct connecting said compressor to said second air space at a location adjacent said top closure; and
a burner adjacent to the lower portion of said furnace section, and



an exhaust duct connected between said turbine and said gas outlet for flowing combustion gases to said turbine; whereby when said drive motor is actuated to drive said turbine, gas will be compressed and forced through said air duct into said second air space to flow to said first air space and to said burner to heat said furnace section and said convection section by exchanging heat with both of said sections so that thereafter fuel may be fed to said burner to be mixed with said air and combusted to heat said heat transfer tubes in said furnace section and said convection section so that combustion gases will flow through said duct to drive said turbine so that said turbine can then supply compressed air to said second and first air spaces and said burner.

3,918,412

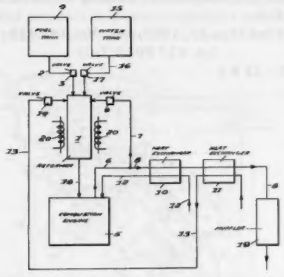
FUEL TREATMENT FOR COMBUSTION ENGINES

Olle B. Lindstrom, Lorensviksvagen 14, Vigbyholm, S-18363 Taby, Sweden

Continuation-in-part of Ser. No. 137,562, April 26, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,165
Claims priority, application Sweden, Sept. 14, 1970, 6000/70
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **13 Claims**

1. A method for the reduction of the amount of polluting components in the flow of exhaust issuing from an Otto cycle internal combustion engine, which method comprises; before delivery of engine fuel to a combustion chamber of the engine, passing at least part of the fuel through a reforming reactor with a reforming catalyst disposed therein and at a temperature between about 250°C. and 1000°C.; delivering water to the reforming reactor to convert in the reforming reactor at least a part of the fuel to carbon monoxide and hydrogen by reaction with steam; delivering between about 5 and about 50% of the flow of exhaust gas from the combustion engine to

the reforming reactor; and mixing therein the exhaust gas and the fuel introduced into the reforming reactor whereby at least



a portion of the water in the reforming reactor is provided by water in the exhaust gas.

3,918,413

COMPOUND ROTARY PISTON ENGINE

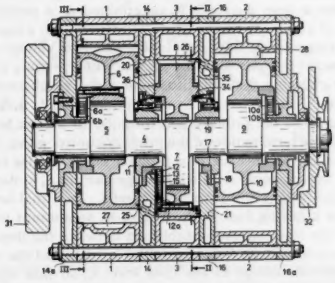
Dankwart Eiermann, and Felix Wankel, both of Lindau, Germany, assignors to Wankel GmbH, Lindau, Germany

Filed June 27, 1973, Ser. No. 374,046

Claims priority, application Germany, July 5, 1972, 2233014

Int. Cl.² F02B *53/08*

U.S. Cl. 123—8.07 **11 Claims**



11. A compound supercharged rotary piston engine device comprising; a pair of axially spaced rotary piston engines, a rotary piston compressor interposed between said engines, a common shaft extending axially through said engines and compressor, a dividing wall member between said compressor and each said engine and each forming the side wall of the compressor and the respective engine, said shaft having coaxial eccentrics for said engines and an eccentric displaced 180° therefrom for said compressor, said compressor forming two opposite compressor chambers, operating on each revolution of said two piston engines, to supply air to each of said two piston engines, each of said walls between said compressor and said piston engines having a pair of substantially diametrically opposite passages between the compressor and each of said piston engines, one passage in each wall leading from one compression chamber of said compressor to the combustion chamber of said piston engine and the diametrically opposite passage in said wall leading to an afterburning chamber in said piston engine, the passages in one wall being displaced 180° from the passages in the other wall and said passages to the afterburning chambers being substantially smaller than those to said combustion chambers.

3,918,414

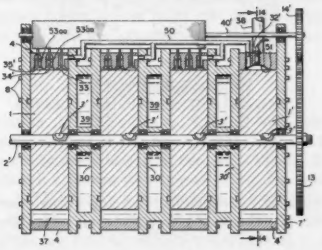
ROTARY MOTOR

Benjamin F. Hughes, Route No. 1, Box 120, Morris, Ala. 35116

Continuation-in-part of Ser. No. 123,986, March 15, 1971, Pat. No. 3,815,554. This application Nov. 5, 1973, Ser. No. 412,792The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.

Int. Cl.² F02B *53/08*

U.S. Cl. 123—8.27 **9 Claims**



1. A motor device comprising in combination: a rotary disk means of circular shape and having predetermineed thickness, rotatable around a central axis thereof and having for separate baffle elements two radially inwardly separately extending slots spaced apart from one another a predetermined distance, on baffle element per slot, and for each slot a separate movably mounted baffle element being defined and movable to and fro radially within its respective slot; chamber structure means defining a substantially closed chamber of a chamber shape and size receivable of the disk means and larger in diameter than the disk means and of thickness slightly greater than that of the disk means such that the disk means is receivable therein with substantially flush opposing sides of the opposite sides of the disk with the respective opposite cavity sides, and including eccentrically located axis means for rotation therearound of the disk means such that one circular edge of the disk mean is closer to a circular edge of the cavity than another opposite edge of the cavity during rotation, and defining as a part of the cavity structure at least two spaced-apart ports located in a circular edge of the chamber a circular periphery thereof as intake and outlet ports for respectively intake and exhaustion of fluid into and from the chamber, and the chamber structure means further defining first and second tracks in respective planar faces having a circular periphery, with the tracks being eccentric to the axis of the disk means, and the baffle element of each respective slot including a track element positioned to ride along the track during rotary motion of the disk means such that the baffle elements extends from and retract into their respective slots of the disk means, there being a separate track for each baffle element.

3,918,415

ROTARY INTERNAL COMBUSTION ENGINE

Choshichi Ishida, Osaka, Japan, assignor to Ishida Industry Company Limited, Osaka, Japan

Filed Aug. 7, 1973, Ser. No. 386,290

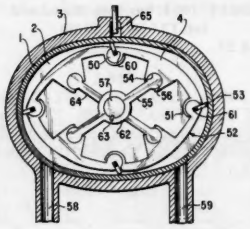
Claims priority, application Japan, Sept. 19, 1972, 47-93824; Oct. 19, 1972, 47-104748

Int. Cl.² F02B *55/14;* **F01C** *1/00, 19/00*

U.S. Cl. 123—8.45 **11 Claims**

1. A rotary internal combustion engine which comprises an elliptical cylinder, four piston elements operatively associated with each other to form a rotor in the shape of a regular quadrangle having angles which form a rhombus with sides of substantially equal length, said elliptical cylinder being concentric with a rotating shaft disposed in the center of said regular quadrangle, the sides of said piston elements and the

sides of the elliptical cylinder defining a plurality of chambers therebetween which extend between the respective verticies of the angles forming the regular quadrangle, wherein each piston element contains a circular arc-like convex pivot shaft



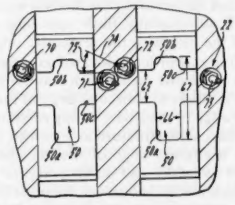
at one end and a concave bay-like grip at the other end, the pivot shaft of one piston element pivotally engaging the bay-like grip of another piston element to form a variable rhombus rotor, and rod means for securing the center portion ot the piston elements to the rotating shaft.

3,918,416

ROTARY ENGINE WITH SIDE MOUNTED SPARK PLUGS

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 6, 1974, Ser. No. 476,824
Int. Cl.² F02B *55/14, 53/12*
U.S. Cl. 123—8.45 **19 Claims**



7. For use in a rotary internal combustion engine having a rotor moving about an eccentric shaft with planetary motion within a housing, an ignition system for igniting a combustible mixture inducted into said engine, the combination comprising:

a. an engine housing having a pair of side walls aligned with the direction of flow of said mixture,

b. a rotor mounted for planetary movement within said housing having a pair of substantially flat side walls arranged adjacent the side walls of said housing and having a non-linear outer periphery defined with a plurality of compression pockets therein and open to the sides of said rotor,

c. means on said rotor for providing a dynamic sealing engagement between said rotor and housing to define variable volume chambers therebetween, and

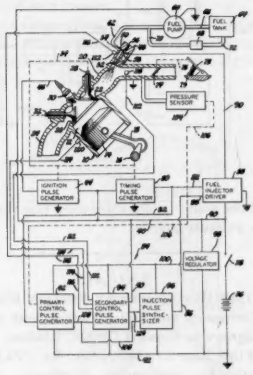
d. means disposed in each of said side walls of said housing, for igniting said mixture, said igniting means being symmetrically arranged about the center line of said flow, and having electrodes axially arranged subjacent the side walls of said housing and circumferentially arranged to align with the trailing quadrant of said compression pocket when in communication with the electrodes for firing.

3,918,417

ELECTRONIC FUEL INJECTION SYSTEM

Charles C. Gambill, Kokomo, Ind., and John P. McGavic, Lake Park, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1972, Ser. No. 301,422
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **4 Claims**



1. In an internal combustion engine, the combination comprising: means for producing a primary control pulse initiated in synchronization with the operation of the engine and terminated after a time duration T_p determined as a preselected function of a primary engine operating parameter; a capacitor having a capacitance C for developing a control voltage thereacross; means responsive to the presence of a primary control pulse for charging the capacitor with a charge current I_c to increase the control voltage from an initial level L_i defined at the initiation of the primary control pulse to a peak level L_p defined at the termination of the primary control pulse; means responsive to the absence of a primary control pulse for discharging the capacitor with a discharge current I_d to decrease the control voltage from the peak level L_p to a final level L_f; means for applying fuel to the engine in an amount proportional to the time interval established between the departure of the control voltage from the initial level L_i and the arrival of the control voltage at the final level L_f so that the total quantity of fuel Q delivered to the engine is defined by the following equation

$$Q \propto T_p(1 + I_c/I_d) + (L_i - L_f)\, C/I_d;$$

means for defining at least one of the charge current I_c and the discharge current I_d of the capacitor as a preselected function of a first secondary engine operating parameter; and means for defining the difference between the initial level L_i and the final level L_f of the control voltage as a preselected function of a second secondary engine operating parameter.

3,918,418

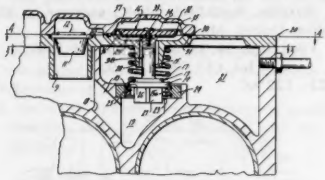
MARINE ENGINE COOLING SYSTEM EMPLOYING A THERMOSTATIC VALVE MEANS AND A PRESSURE RELIEF VALVE MEANS

Norman E. Horn, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 6, 1973, Ser. No. 348,661
Int. Cl. F01p *7/14*
U.S. Cl. 123—41.08 **10 Claims**

1. An internal combustion engine having a cooling jacket means and a pump for circulating coolant through the jacket in accordance with a pressure related to the engine speed, a valve seat means defining an outlet duct for communication

between the cooling jacket and a discharge chamber, a pressure relief valve member seated on said valve seat means and resiliently biased to a closed position and providing an initial opening in response to a selected coolant pressure in said jacket, a fluid pressure responsive operator means coupled to said valve member and subjected to the pressure on the discharge chamber side of the valve member said operator including a diaphragm means in said discharge chamber and coupled to said valve member and subjected to the pressure on the downstream side of the valve member and said diaphragm means providing a snap action opening of the valve member in response to initial opening thereof to produce a complete and stable opening of the outlet duct.



3,918,419

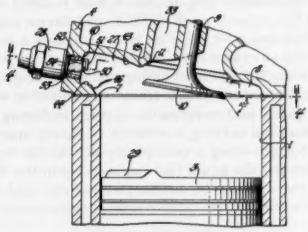
SEGREGATED LEAN-RICH FED SPARK IGNITION ENGINE

John Dolza, Sr., 810 State St., Fenton, Mich. 48430

Filed Aug. 20, 1973, Ser. No. 388,849

Int. Cl.[2] F02B *19/10, 75/02*

U.S. Cl. 123—75 B **12 Claims**



1. In a four-stroke cycle spark ignition internal combustion engine having a power cylinder with a piston and a single inlet valve, a main combustion chamber at one end of the cylinder, an inlet passage having a connection to said main combustion chamber, a seat for said inlet valve surrounding said inlet passage at its connection to the main combustion chamber, a partition longitudinally dividing the inlet passage into separate passage sectors, said partition terminating at the valve seat with spaced wall portions defining a restricted entrance to the main combustion chamber for flow of spark ignitable gaseous fuel mixture into the main combustion chamber from one of said passage sectors, said restricted entrance having an area of five to twenty percent of the total area bounded by said valve seat, an elongated segregation chamber for receiving and retaining a portion of said ignitable fuel mixture entering the main combustion chamber, the configurations of said main combustion chamber and piston cooperating to maintain a continuously open and unrestricted entrance for flow of said spark ignitable mixture into the segregation chamber from the main combustion chamber throughout the reciprocatory stroke of the piston, said segregation chamber extending from the main combustion chamber a distance of one-fifth to one-half the diameter of the cylinder and having a volume of one percent to four percent of the piston-swept volume of the cylinder, and a spark plug having exposed spark generating electrodes projecting into the extended end of the segregation chamber, the length of the segregation chamber as measured from its said open end to its said extended end in relation to its volume being sufficient to provide that the portion of said ignitable fuel mixture remaining within the segregation chamber and compressed against said extended end during the compression stroke of the piston extends a sufficient distance from said extended end to envelop said electrodes, said piston having a ridge projecting toward the main combustion chamber and extending transversely of the piston opposite said restricted entrance for directing toward the open end of the segregation chamber during the compression stroke of the piston gaseous fuel mixtures contained in the cylinder between said ridge and the adjacent side of the cylinder.

3,918,420

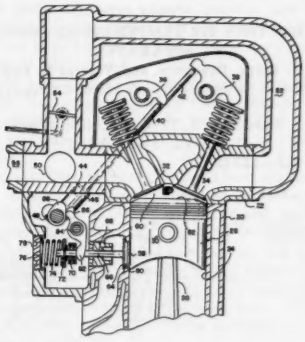
INTERNAL COMBUSTION ENGINE

Tony R. Villella, 3106 Hewitt Ave., Everett, Wash. 98201

Continuation-in-part of Ser. No. 469,033, May 10, 1974, which is a continuation-in-part of Ser. No. 432,662, Jan. 11, 1974, which is a continuation-in-part of Ser. No. 353,341, April 23, 1973, which is a continuation-in-part of Ser. No. 322,761, Jan. 11, 1973. This application Aug. 9, 1974, Ser. No. 496,328

Int. Cl. F02m *25/06;* **F02b** *75/02;* **F02d** *39/02*

U.S. Cl. 123—75 C **13 Claims**



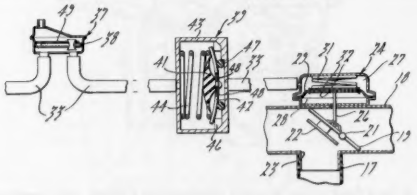
1. In a four cycle internal combustion engine, the combination of: a cylinder having a head end; a cylinder head at said head end; said cylinder having a crankcase end; a piston having a top portion facing said head end; said piston reciprocally mounted in said cylinder; a connecting rod pivotally coupled to said piston; a crankshaft pivotally carrying said connecting rod; a fuel inlet valve communicating with said head end of said cylinders; an exhaust outlet valve disposed in communication with said head end of said cylinder; said cylinder having an exhaust outlet opening in the side wall thereof; said exhaust outlet opening communicating with atmosphere and having an area spaced from said head end of said cylinder a distance equal to a major power portion of the stroke of said piston in said cylinder; said outlet opening having an exhaust edge spaced from a top dead center position of the top of said piston; said distance corresponding to a range between 60° and 110° of crankshaft rotation from said top dead center position of said top of said piston; whereby, on the power stroke of said piston, said top thereof passes said exhaust edge of said outlet opening at a time when combustion gasses in said cylinder are at a pressure high enough to rapidly expell a hot stratum of gas from the top of said piston and outwardly through said outlet opening, and whereby said hot gas stratum adjacent said piston is relatively light and fluid as compared to the remaining gasses around the relative cool quench area of the cylinder and said head, thus said hot gas stratum moves rapidly away from said remaining gasses and said hot gas

stratum carries a substantial amount of B.T.U.'s from said cylinder after remaining there for only a very short time during approximately 60° to 110° of crankshaft rotation; thus minimizing heat exchange from said gas to said cylinder and said head; and whereby heat, critical to the formation of nitrogen oxide, is released from said cylinder well before the following exhaust stroke of said piston and the subsequent power stroke thereof; and whereby said exhaust outlet valve is relieved of all the hot gases which previously pass through said outlet opening; thereby minimizing heating of said head and said head end of said cylinder and said exhaust valve and to thereby alleviate the formation of nitrogen oxides during the combustion of fuel in said cylinder and during the power stroke of said piston and whereby any heat collected in the area of said exhaust outlet opening is substantially remote from the gasses being combusted in said cylinder during said power stroke to further minimize formation of nitrogen oxides and whereby, during the exhaust stroke of said piston, the relatively small amount of said remaining gas requires a minimum of compression force to expell said remaining gas through said exhaust valve thereby saving power and reducing piston friction and resultant heating of said cylinder all of which contributes to continuous relatively cool operation in the combustion area of the cylinder and its head and during successive combustion cycles therein so as to minimize the overall formation of nitrogen oxides.

3,918,421
INDUCTION AIR TEMPERATURE CONTROL APPARATUS

Thomas G. Berry, Dearborn, and Vincent L. Fyie, Ferndale, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 1, 1974, Ser. No. 447,450
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 D **7 Claims**



1. Apparatus to regulate the intake air temperature of an internal combustion engine,

said engine including an intake manifold and a carburetor in communication with said intake manifold,

said apparatus including first and second air inlet conduits, said first conduit opening to a source of ambient air, said second conduit opening to a source of heated air, means communicating each said conduit with said carburetor, valve means movable to open and close said first and second conduits so as to provide said carburetor with heated air or ambient air or a mixture of heated and ambient air, a vacuum motor connected to said valve means to move said valve means in response to a vacuum signal,

a vacuum passage communicating said vacuum motor and a source of intake manifold vacuum,

a temperature sensitive air bleed means positioned in said vacuum passage, said air bleed means being openable in response to changes in temperature to reduce the vacuum signal to the vacuum motor,

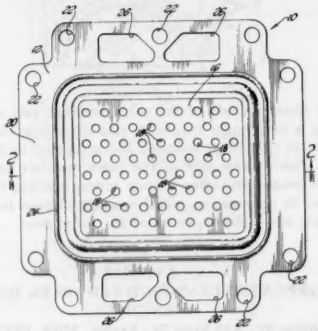
a temperature sensitive valve positioned in line in said vacuum passage between said air bleed means and said vacuum motor to open and close said vacuum passage in response to changes in temperature, said temperature sensitive valve being closed when the sensed temperature is below a predetermined magnitude,

and a check valve positioned in line in said vacuum passage between said air bleed means and said vacuum motor and in parallel with said temperature sensitive valve.

3,918,422
FUEL EVAPORATOR PLATE

Alexander Kargilis, Southfield, Mich., assignor to McCord Corporation, Detroit, Mich.

Filed Sept. 24, 1973, Ser. No. 400,399
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AC **8 Claims**



1. A fuel evaporation device to be disposed in the fuel/air mixture path between a carburetor and intake manifold of an internal combustion engine and in heat transfer relationship with the hot exhaust gases thereof, said device comprising: a thermally-conductive plate member including a heat transfer surface and an evaporation surface, said plate member including mounting means for mounting said plate member with said heat transfer surface in heat transfer relationship with the hot exhaust gases, said evaporation surface including a layer of porous material defining a network of fluidly interconnected cavities for providing a multiplicity of sites for vapor nucleation whereby the liquid fuel impinges upon the evaporation surface and is drawn by capillary action into said network of fluidly interconnected cavities until it evaporates.

3,918,423
POLLUTION CONTROL DEVICE

Leonel da Fonseca Amor, Mozambique, Portugal, assignor to Ike Schield, Brooklyn, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,692
Claims priority, application Portugal, Jan. 9, 1973, 59145
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AC **5 Claims**

1. A device for reducing toxic gases emissions from the exhaust of explosion and internal combustion engines and for reducing fuel consumption, comprising

a. a heat collector adapted to be mounted in heat exchange relation to the outer wall of the exhaust pipe or manifold of an engine,

b. a homogenizer adapted to be in communication with the outlet of a carburetor and the intake manifold of the engine, and

c. duct means including a plurality of tubes and fittings connected to and for establishing communication between said heat collector and said homogenizer,

d. said homogenizer including a housing having therein

i. a first chamber adapted to be placed into direct communication with the carburetor outlet,

ii. a second chamber adapted to be placed into direct communication with the intake manifold of the engine, and

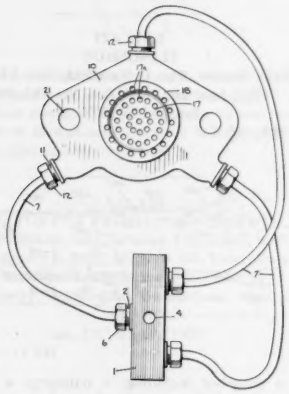
iii. a perforated partition interposed between said chambers for effecting a distribution of the air/fuel mixture through said second chamber,

iv. said partition being a sieve-like structure having multiple apertures therein arranged in a plurality of concentric circular rows,

v. said partition being provided on the surface thereof facing said second chamber with a plurality of concentric circular grooves separated by intermediate lands,

vi. each of said grooves being aligned with a respective row of said apertures and in communication with all the apertures of that row,

vii. the width of each groove increasing gradually in the direction away from its juncture with the associated apertures,



viii. said housing being further provided with a plurality of passageways each extending from its juncture with a respective one of said tubes to said second chamber and terminating thereat in a generally oval, transversely oriented inlet opening,

ix. said inlet openings being equidistantly spaced from one another peripherally of said second chamber, and

x. said housing being further provided with a nozzle or throttle member in each of said passageways for regulating the entry of heated air into said second chamber to a predetermined volume rate of flow, and

e. said heat collector being a hollow structure filled with a fibrous air-filtering material and provided with at least one air admission opening through which ambient air can be drawn into the heat collector as a function of the vacuum created by the movement of the pistons of the engine and applied to the interior of said hollow structure via said duct means,

f. whereby the air, after being heated in said heat collector, can enter said second chamber of said housing of said homogenizer and there come into intimate admixture with the air/fuel mixture entering said second chamber from the carburetor via said first chamber and said partition, so as to impart to said mixture a greater burning capacity resulting in both a substantial reduction of toxic gases emissions from the engine as well as in savings of fuel.

3,918,424

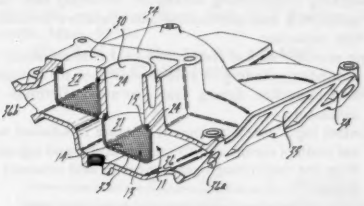
INTEGRALLY CAST QUICK HEAT INTAKE MANIFOLD

John T. Anderson, Ypsilanti, and Howard A. Aula, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1974, Ser. No. 448,798

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AC **6 Claims**



1. A method of fabricating an intake manifold for an internal combustion engine including an early evaporation element integral therein, the improvement in the method comprising:

a. preparing a core box having a cavity in the shape of runner passages for the ultimate intake manifold,

b. inserting an early evaporation element in the form of a sheet metal channel having peripheral protuberances spaced along the edges of said channel, said channel being placed into at least one portion of said cavity having a contour effective to nest snugly with the cavity outer contour of said channel,

c. injecting a mixture of resin impregnated sand into said core box for forming a sand core in conformity with the cavity of said core box and the interior of said channel, curing said core assembly under heat to provide a firm structure,

d. placing said core assembly, stripped from said core box, into a molding assembly having appropriate cavity for defining the intake manifold within a ceramic filler, pouring molten metal into said refractory cavity to form a casting about said runner passage and liner in a manner to lock with the protuberances of the channel without penetrating to the interior side of said channel which is in intimate contact with said sande core, and

e. removing said sand coring from the solidified casting and interlocked channel.

3,918,425

ELECTRONIC DEVICE SERVING TO SUPPLY A LOAD WITH CONSTANT VOLTAGE PULSES

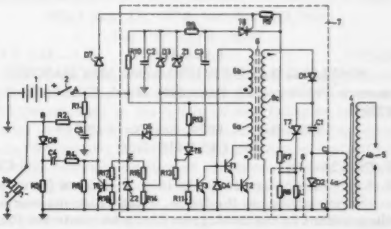
Jean-Bernard Pulzer, Neuchatel, Switzerland, assignor to Setco la Chaux-de-Fonds S.A., La Chaux-de-Fonds, Switzerland

Filed Sept. 24, 1973, Ser. No. 400,143

Claims priority, application Switzerland, Sept. 25, 1975, 14070/72

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 E **9 Claims**



1. An electronic device including means for supplying a load with constant voltage pulses, said device comprising:

power supply terminals connectable to a source of electrical energy,

an oscillator connected to said power supply terminals, comprising at least one active electronic element and a transformer having a plurality of windings forming at least one primary winding in cooperative relationship with said active element and at least one secondary winding electrically separated from said active electronic element,

switching conditioning means for switching said oscillator selectively into inoperative and operative conditions,

a first capacitor,

first rectifier means connecting said first capacitor to said secondary winding of said transformer for charging said first capacitor during said operative condition of said oscillator,

control input receiving means settable in relation to external control means and to receive command signals therefrom for controlling occurrences of said constant voltage pulses,

output terminal means connectable to said load,

main controlled electronic means comprising an on/off device in series with said first capacitor in a discharge circuit thereof, connected for operating under control of said control input receiving means, and for causing said first capacitor to discharge through said discharge circuit across said output terminal means upon receiving one of said command signals,

a second capacitor,

second rectifier means connecting said second capacitor to a winding of said transformer separate from said secondary winding to which said first capacitor is connected,

auxiliary controlled electronic means connected for operating under control of said control input receiving means and causing said second capacitor to discharge upon receiving one of said command signals,

voltage level detecting means connected to said second capacitor for detecting the attainment of a predetermined charging voltage thereon,

said first and said second rectifier means simultaneously and homologously charging said first and said second capacitors,

said main and said auxiliary controlled electronic means simultaneously causing said first and said second capacitors to homologously discharge,

said first rectifier means and said main controlled electronic means preventing any current from flowing through said first capacitor during said inoperative condition of said oscillator with said on/off device in the off condition,

and said switching conditioning means being responsive to said voltage level detecting means for switching said oscillator to said inoperative condition, and being responsive to one of said main and auxiliary controlled electronic means for switching said oscillator to said operative condition.

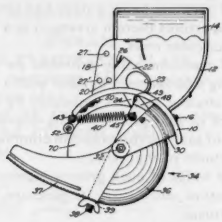
3,918,426

BOWLING BALL PROPELLING MECHANISM

Francesco Privitera, 79 Peacedale Road, Cumberland, R.I. 02864

Filed Dec. 5, 1974, Ser. No. 529,711
Int. Cl.² F41B 7/00
U.S. Cl. 124—16 **4 Claims**

1. A ball hurling device comprising an arcuate frame member, a handle affixed to the frame, a ball receiving carriage, a resilient means in the carriage to bias a ball outward thereof, said carriage being pivotally mounted on the frame, means spring biasing the carriage to a forward pivoted position to release a ball held between the frame and carriage, and means to latch the carriage in a rearmost pivoted position whereby when the latch is released the carriage will be pivoted forwardly under the bias of the spring means and release a ball contained therein.

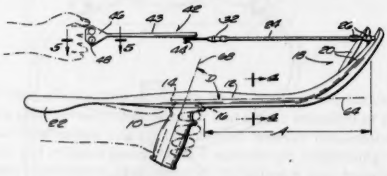


3,918,427

SLINGSHOT

Don La Viere Turner, Rte. 1, Westfield, Wis. 53964

Filed June 26, 1974, Ser. No. 483,192
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 B **6 Claims**



1. In a slingshot including; a handgrip, a fork having branches and located forwardly of the handgrip with respect to a user, an arm connecting the fork and handgrip, a forearm brace attached to said handgrip and extending rearwardly therefrom, an elastic means attached to said arms for propelling a missile therethrough, the terminal end of one of the branches of said fork being positioned more rearwardly toward a user than the other branch, whereby an imaginary line connecting the attachment points of said elastic means is substantially perpendicular to an imaginary line extending to the eyes of a user, said imaginary line connecting the attachment points forming an acute angle with the axis of the arm, thereby facilitating aiming of the slingshot and increasing the accuracy thereof, said forearm brace being curved and there being a central plane tangent to said forearm brace, the axis of said handgrip being cocked forwardly to one side with respect to the axis of said arm and laterally with respect to the central plane.

3,918,428

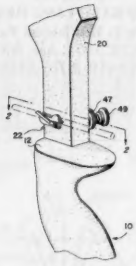
ADJUSTABLE TYPE ARROW REST FOR A BOW

Jack K. Wilson, and Robert S. Wilson, both of Rte. 16, Box 200, Springfield, Mo. 65807

Filed Sept. 3, 1974, Ser. No. 502,844
Int. Cl.² F41B 5/00
U.S. Cl. 124—41 A **6 Claims**

1. Apparatus for attachment to an archery bow comprising a movable plate member adapted to be disposed at and connected to one side of a bow, an arrow rest secured to said plate member to support the bottom of an arrow, said plate member having an arrow pressure point contact area which contacts the side of an arrow when the bottom of the arrow is on said arrow rest, connecting means for connecting the plate to a bow including a telescoping rod member to extend through an opening in the side of a bow, attachment means on said plate

member for attaching said rod member to said plate member adjacent one end of said plate member, means to normally bias said plate member and said arrow rest away from a bow while permitting movement of said plate member and said arrow rest and pressure point contact area toward a bow



against the bias of said biasing means as an arrow is shot from a bow, and telescoping alignment means adjacent the other end of said plate member for interconnecting said plate member and the bow to maintain a desired horizontal position of said plate member relative to a bow.

3,918,429

APPARATUS FOR PROFILING WORK PIECES

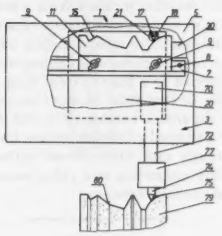
Helmut Ott, Pfaffikon, and Jaroslav Vlk, Uster, both of Switzerland, assignors to Gebr. Mageric AG, Uster, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,492

Claims priority, application Switzerland, Apr. 2, 1974, 4551/74

Int. Cl.² B24B *53/08*

U.S. Cl. 125—11 PH **11 Claims**



1. Apparatus for profiling work pieces comprising a template having a one-to-one relationship with the desired profile of the work piece, a tool carriage mounted for vertical and horizontal movement with respect to the template, a profiling tool and a template follower mounted to the carriage in rigid relationship for engagement with the work piece and template contour respectively, a weight of mass several times greater than the tool mounted adjacent the tool to reduce its vibration during operation, means for reciprocating the carriage in a horizontal direction, means for moving the carriage in a vertical direction between an operative position where the tool engages the work piece and the follower engages the template and an inoperative position out of such engagement, and a hydraulic suspension system for suspending the carriage in its operative position permitting the carriage to move vertically and the tool to exert a constant force on the work piece equal to that force only necessary to keep the follower in contact with the template, said suspension system including a cylinder portion and a piston portion and means for rotating at least one of said portions with respect to the other to eliminate static friction as the carriage moves back and forth vertically in response to the contour of the template.

3,918,430

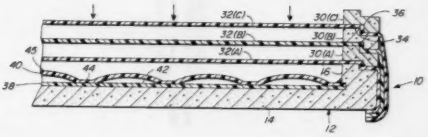
SOLAR HEATING SYSTEM AND COMPONENTS THEREOF

Harry E. Stout, and Brian Stout, both of 2 Brastow Ave., Somerville, Mass. 02134

Filed July 17, 1974, Ser. No. 489,150

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. A solar heating panel, comprising

a. a frame of rigid foam plastic material formed with a flat rear wall and integral marginal side and end walls extending from one face and along the edges thereof,

b. a relective stratum disposed over said one face of said rear wall in flush face to face contact therewith,

c. a ply of waterproof plastic black body material bonded to said stratum along spaced parallel lines extending lengthwise of said panel to form a plurality of elongated, parallel thin and relatively flat channels between said end walls,

d. said end walls being hollow and communicating with said channels,

e. conduit means connected to said end walls for delivering a liquid medium into one end wall, through said channels and from the other end wall, and

f. a plurality of strata of transparent plastic flexible sheet material mounted to said side and end walls in spaced parallel relation to one another and to said rear wall, and,

g. spacer members of rigid foam plastic material mounted along said side and end walls between each stratum of sheet material.

3,918,431

FALLOPIAN TUBE OBTURATING DEVICE

Manfred Sinnreich, 160 Fort Hill Road, Scarsdale, N.Y. 10583

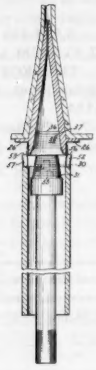
Filed Jan. 11, 1974, Ser. No. 432,700

Int. Cl.² A61B *19/00*

U.S. Cl. 128—1 R **4 Claims**

2. A fallopian tube obturator for use in effecting permanent or reversible female sterilization by positioning the same to overlie the opening to the lumen of said fallopian tube, said obturator comprising a main body element having means thereon for engaging tissue bordering said lumen, and defining a generally centrally positioned threaded opening overlying said opening to said lumen, a plug element having threaded means selectively engaged with said opening to close said lumen; said main body element having first tool-engaging means, said plug element including second tool-engaging means concentrically arranged with respect to said first tool-engaging means, whereby said obturator may be installed in

position as a unit, and engagement of said first and second tool-engaging means permits the holding of said body element



in installed position while disengaging said plug element therefrom.

3,918,432

METHOD OF TRANSPORTING BABIES IN A HEATED INCUBATOR

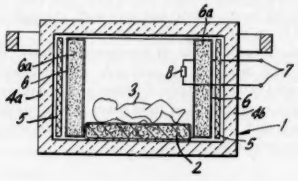
Wolfgang Franz, Lubeck, and Jens Stallbaum, Lubeck-Moisling, both of Germany, assignors to Dragerwerk AG, Germany

Division of Ser. No. 391,134, Aug. 24, 1973, Pat. No. 3,876,859. This application May 9, 1974, Ser. No. 468,363

Claims priority, application Germany, Aug. 25, 1972, 2241937

Int. Cl.² A61G *11/00*

U.S. Cl. 128—1 B **3 Claims**



1. A method of transporting babies to be held under controlled temperature conditions in a comfort temperature range of the infant comprising providing a transportable incubator without any power source and which has an infant receiving compartment, placing a substance within the compartment which is harmless to babies and which has a melting temperature in the comfort temperature range of the infant and is capable of emitting heat to the compartment whenever it is subjected to temperatures below its melting temperature, placing a heater in the compartment adjacent the substance heating the substance during a preparation time to a temperature above its crystallization temperature by connecting the heater to an exterior heating source, and keeping the temperature within the compartment during the preparation time above the melting point of the substance, placing the baby in the compartment, stopping the heating of the interior of the compartment by disconnecting the exterior heating source and closing the compartment, transporting the incubator with the infant while permitting the substance to heat the interior of the compartment during transportation time without any heat supply by giving up its latent heat by solidification whenever the temperature in the compartment tends to lower below the melting temperature of the substance.

3,918,433

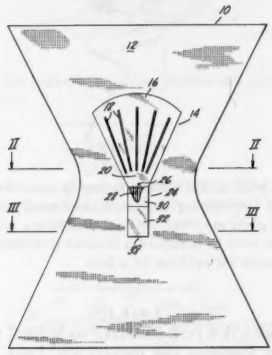
FLUID SAMPLING DEVICE

Richard C. Fuisz, R.D. 1, Bethlehem, Pa. 18017

Filed May 22, 1974, Ser. No. 472,290

Int. Cl.² A61B *5/10*; A61F *13/00*

U.S. Cl. 128—2 F **21 Claims**



1. In combination with wearing apparel, for sampling body fluid issuing from a subject: means carried by said apparel for controlling the rate of flow of said body fluid including valve means having a surface expanse for conducting a predetermined volume of fluid therethrough at one rate and thereby rendered substantially non-conducting to fluid flow for another rate; sheet member means having a surface expanse for fluid disposition in an area of issuance of said body fluid and continuous with said valve means surface expanse, said sheet member means surface expanse including means for conducting fluid thereacross to a lesser extent than said valve means surface expanse, so that fluid incident on said sheet member means surface expanse is conducted to and through said valve means surface expanse; container means for containing fluid conducted through said valve means surface expanse; and means for fixedly supporting said valve means in fluid-issuing relation to said container means.

3,918,434

METHOD AND APPARATUS FOR DETERMINING THE PERFUSION EFFICIENCY FACTOR OF ANIMAL TISSUE

Dietrich W. Lübbers, Dortmund, and Albert Huch, Marbach, Marburg, both of Germany, assignors to Eschweiler & Co., Germany

Filed Nov. 14, 1973, Ser. No. 415,803

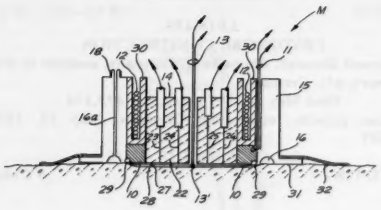
Claims priority, application Germany, Nov. 15, 1972, 2255879

Int. Cl.² A61B *6/00*

U.S. Cl. 128—2 A **13 Claims**

1. A method of determining the perfusion efficiency factor of animal tissue having blood vessels containing indicator substances therein, comprising the first step of percutaneously measuring the perfusion rate in animal tissue at a specific locus, said first step including heating a first member adapted to be placed against the tissue to be measured, measuring a first temperature of said first member, measuring a second temperature of a second member located centrally of said first member, comparing said first and second temperatures and forming a first differential signal which is proportional to the perfusion rate of the tissue; the second step of simultaneously percutaneously measuring the concentration of the indicator

substances in the blood vessels in the tissue at the same locus and generating a second signal which is proportional to the concentration of the indicator substances in the blood vessels;



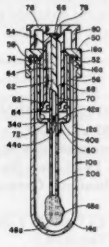
and the third step of processing said first and second signals for generating a third signal which is indicative of the perfusion efficiency factor.

3,918,435

TRANSPORT SWAB TUBE

Glenn Lee Beall, Gurnee, and Fred K. White, Glen Ellyn, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 24, 1974, Ser. No. 436,223
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 W **5 Claims**



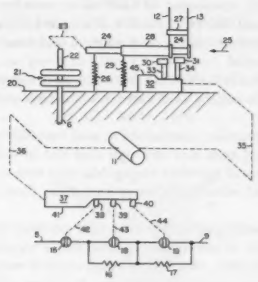
1. A transport swab tube apparatus comprising in combination a tube container having a closed end and an open end, a cap removably attached in sealing relationship to said open end of said tube container, a tubular swab member supported by said cap having a length less than that of said tube container and having an opening at each end thereof, bibulous swab material carried by and covering the opening at one end of said swab member, a liquid storage receptacle supported by said cap, a passage communicating between said liquid storage receptacle and the other end of said swab member, and a relatively movable sealing means associated with said receptacle and said swab member, said sealing means when in a first position sealing the interior of said receptacle from said passage and when in a second position affording communication between the interior of said receptacle and said passage so that liquid can flow from said receptacle through the tubular swab member and become absorbed by said bibulous swab material, said tubular swab member being supported by said removable cap in such a manner that said bibulous swab material is positioned within said tube container and out of contact therewith when said removable cap seals said open end of said tube container.

3,918,436

BLOOD PRESSURE MEASURING SYSTEM

Edward Lynn Peart, Arden, and Billy Otis Martin, Asheville, both of N.C., assignors to Sybron Corporation, Rochester, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,519
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 G **8 Claims**



1. A system for measuring blood pressure, said system having a pressurizable cuff for variably obstructing an artery, an inflator for pressurizing said cuff with fluid, a manometer for measuring the fluid pressure in said cuff, and bleed means having fluid resistance for bleeding said fluid out of said cuff via said fluid resistance, said system having means for connecting said inflator to said cuff, said manometer to said cuff, and said fluid resistance to said cuff;

said manometer havng an indicator immobilizable for indicating the value of said fluid pressure prevailing at the moment of immobilizing said indicator;

said system also having a controller means manually operable for immobilizing said indicator;

said system also having means for varying said fluid resistance such as to cause the fluid pressure in said cuff to decrease; and

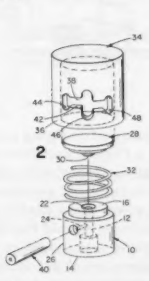
said controller means being operatively connected to said means for varying said fluid resistance, said controller means, when manually operated to immobilize said indicator, causing said means for varying said fluid resistance to vary said fluid resistance by a predetermined amount.

3,918,437

VALVE

Joseph M. Saba, Waltham, Mass., assignor to Technical Resources, Inc., Waltham, Mass.

Filed July 8, 1974, Ser. No. 486,615
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 G **10 Claims**



1. A fluid control valve, comprising:

a base having opposed ends and a side therebetween, a first passage extending therethrough between said ends, and a

branch passage extending from said first passage therethrough to said side of said base, said base adapted for connection at one end to the valve stem of a container of pressurized fluid with said valve stem in fluid-flow communication with said first passage;

a valve member overlying and extending across said first passage at the other end of said base, said valve member adapted for movement to and away from said first passage to open and close said first passage;

wall means connected to said valve member for common movement therewith, said wall means extending from said valve member along said side of said base and having a slot therein;

biasing means connected between said valve member and said base urging said valve member away from said first passage;

a control member connected to said base side and extending from said base side through said slot in said wall means, said control member engagable with one wall of said slot with said valve member spaced away from said first passage;

said slot enlarged relative to said control member in the direction of movement of said valve member and transverse thereto, said slot and said control member movable relative to each other in the direction of movement of said valve member and transverse thereto, and said one wall of said slot having a plurality of transverse positions spaced different distances from said valve member for engagement with said control member;

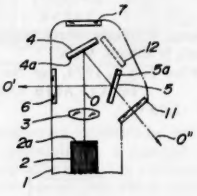
whereby the engagement of said control member and said one wall of said slot limits and defines the extent of opening of said valve member relative to said first passage in a particular transverse position of said slot and the extent of such opening may be varied by placing said control member in another said position of said slot, thereby to control the rate of release of fluid pressure in said branch passage.

3,918,438

ENDOSCOPE CAPABLE OF CHANGING OVER THE DIRECTIONS OF VISUAL FIELD

Yoshisada Hayamizu, and Katsuyuki Kanehira, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,214
Claims priority, application Japan, Apr. 16, 1973, 48-42820
Int. Cl.² A61B 1/00
U.S. Cl. 128—4 **5 Claims**



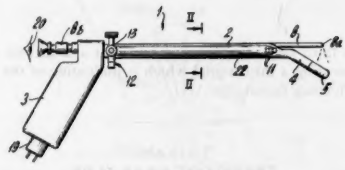
1. An endoscope capable of changing over the directions of visual field comprising a flexible part provided at its front and rear ends with rigid parts, respectively, said front end rigid part being provided at its front end and lateral side with direct sight and lateral sight cover glass windows, respectively, an optical fiber bundle enclosed in said flexible part and having front and rear end surfaces terminated in said front and rear end rigid parts, respectively, an objective lens arranged in said front end rigid part, an eyepiece arranged in said rear end rigid part, first and second reflecting mirrors arranged in front of said objective lens with their reflecting surfaces opposed and inclined with each other, said first reflecting mirror being (adapted to be) selectively inserted into and removed from the optical axis of said objective lens, and said first and second mirrors being selectively movable so as to cooperate and provide a visual field through said lateral side.

3,918,439

CRYOPROBE CONSTRUCTION

Hildebrand Zimmer, Ahrensburg, Germany, assignor to Drägerwerk AG, Germany

Filed May 24, 1974, Ser. No. 473,194
Claims priority, application Germany, May 24, 1974, 2326507
Int. Cl.² A61B 1/30, 17/36
U.S. Cl. 128—7 **9 Claims**



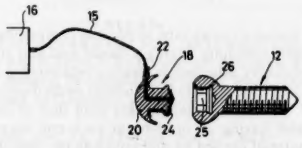
1. A cryoprobe for low temperature treatment to be formed in body cavities, particularly in the bladder, comprising an elongated hollow shaft having insulation therein against low temperature, an observation optics mounted in said shaft for displaceable movement, said shaft having a front portion which is disposed at an angle to the longitudinal axis of said shaft and which forms a probe, means for cooling said probe and scavening passage means extending along said shaft and having an opening adjacent said probe.

3,918,440

DEVICE FOR PROMOTING FORMATION OF BONE MATERIAL

Werner Kraus, 31 Bauerstrasse, D-8 Munich 40, Germany

Filed July 6, 1973, Ser. No. 377,018
Claims priority, application Germany, Mar. 9, 1973, 2311817
Int. Cl.² A61N 1/00
U.S. Cl. 128—82.1 **6 Claims**

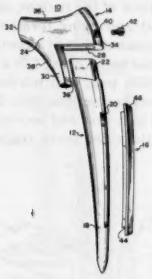


1. In an implantable device for promoting the formation of bone material in the region of the bone structure of a living being by the application of an A.C. signal, the device including at least two metal bone screws capable of being inserted into the bone structure and a pick-up coil having at least two connecting wires, each of which is to be electrically connected to a corresponding one of the metal bone screws, the improvement comprising: a plurality of first locking means each connected to a respective one of said connecting wires; and receiving means provided by each of said bone screws for receiving said locking means of said corresponding connecting wire so that each said connecting wire is connected in an interlocking relationship to said corresponding bone screw.

3,918,441
INTRAMEDULLARY HIP PIN

Philip E. Getscher, 2700 Eastgate St., Lincoln, Nebr. 68502

Filed Sept. 17, 1974, Ser. No. 506,694
Int. Cl.² A61F 5/04
U.S. Cl. 128—92 BC 10 Claims



1. An intramedullary hip pin for supporting a fractured femur comprising:

a head portion shaped to fit within the neck of the femur;

an elongated shank portion adapted to fit within the medulla of the femur shaft;

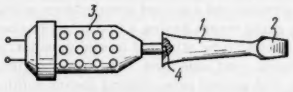
said head portion having a concave saddle portion having a curved surface substantially conforming to the curvature of the neck of the femur; and a blunt-nose surface substantially orthogonal to the saddle portion whereby said blunt-nose surface resists penetrating the head of the femur;

and coupling means for removably coupling while within said femur said head portion and shank portion in orthogonal relationship, with said shank portion extending from the head portion in the same direction as the concave portion of said saddle, whereby said shank extends downwardly through the medulla of a femur shaft and the head portion is beneath the neck of the femur so that the saddle receives forces from the pelvis and distributes these forces through the shank along the medulla along the femur shaft while bracing the fractured portions of the femur.

3,918,442
SURGICAL INSTRUMENT FOR ULTRASONIC JOINING OF BIOLOGICAL TISSUE

Georgy Alexandrovich Nikolaev, Pionersky Pereulok, 3, kv. 12; Vladimir Ivanovich Loschilov, ulitsa Kibalchicha, 11, kv. 83; Sergei Mikhailovich Volkov, Zoologicheskaya ulitsa, 3, kv. 92; Viktor Grigorievich Vedenkov, Chernomorsky bulvar, 4, kv. 349, all of Moscow; Valery Dmitrievich Leonichev, Oktyabrskoe shosse, 405, Ljubertsy Moskovskoi oblasti; Valentin Alexandrovich Polyakov, ulitsa Klary Tsetkin 17, kv. 48, and Mstislav Vasilievich Volkov, ulitsa Stroitelei, 6, korpus 1, kv. 63, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 404,913, Oct. 10, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,800
Int. Cl.² A61F 5/04
U.S. Cl. 128—92 G 4 Claims

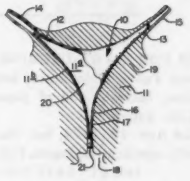


1. A surgical instrument for ultrasonic welding and deposition of biological tissue, comprising an ultrasonic oscillations source; a concentrator connected to the ultrasonic oscillations source and gradually conjugating with a welding tip spaced from direct contact with both fragments of biological tissue being joined and a binder material preliminarily placed there between; said welding tip being defined as a metal blade having at least one flat face inclined at an angle of 90° ± 45° relative to the tip longitudinal axis and extending from the sector of smooth conjugation with the concentrator.

3,918,443
METHOD FOR BIRTH CONTROL

William O. Vennard, and Jack C. Wright, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Division of Ser. No. 190,780, Oct. 20, 1971, Pat. No. 3,779,241. This application Aug. 27, 1973, Ser. No. 391,625
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 5 Claims

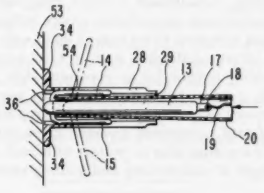


1. The method of birth control which includes: positioning an inflatable, non-irritating, flexible, hollow body substantially within the uterine cavity, said body being formed from a material selected from the group consisting of polyvinyl pyrrolodone, polycellulosics, and polyvinyl alcohol, which material is soluble in fluids normally present in the uterine cavity; filling said hollow body with a liquid polymerizable prepolymer or monomer to produce a flexible, compressible intrauterine contraceptive device having the shape of the uterus; and dissolving said hollow body with uterine fluids.

3,918,444
APPARATUS FOR INSERTING AN INTRAUTERINE DEVICE

Seymour Hoff; Sharon A. Kehr, both of San Jose, and Bruce B. Pharriss, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 27, 1974, Ser. No. 455,237
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 15 Claims



1. A cap for use in combination with:

an intrauterine device inserter comprising an elongated tube adapted to be inserted into the uterine cavity via the cervix; and

an intrauterine device comprising a stem member and at least one flexible arm member depending generally outwardly from said stem member and adapted to be mounted on one end of the tube with the stem member extending into said tube and the arm member seated on said end and extending outwardly of the tube, said mount-

ing being the final position of the device relative to the tube prior to insertion into the uterine cavity;

to fold said arm member inwardly down along the exterior of the inserter tube prior to inserting the intrauterine device into a uterus via the cervix, said cap comprising:

a. an open ended tubular sleeve adapted to fix axially slidably about said one end of said inserter tube;

b. a slot for each arm member in said sleeve for receiving said arm member therethrough such that the arm member extends from the interior of the sleeve through the wall of the sleeve via the slot to the exterior of the sleeve; and

c. a way for each arm member in the inner surface of the sleeve for slidably receiving said arm member as the sleeve is slid axially on said tube toward the other end thereof said way being in axial alignment with the slot and extending from the slot toward the leading end of the sleeve.

3,918,445

INSERTER FOR INTRA-UTERINE DEVICE (IUD)

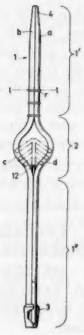
Tadao Okamoto; Takeo Komamura, both of Tokyo, and Atsumi Ishihama, Morioka, all of Japan, assignors to Fuji Latex Co., Ltd., Japan

Filed Apr. 19, 1974, Ser. No. 462,582

Claims priority, application Japan, Feb. 26, 1974, 49-21984

Int. Cl.² A61F *5/46*

U.S. Cl. 128—130 **8 Claims**



1. An inserter for an intra-uterine device for contraceptive use comprising, in combination, a pair of elongated continuous and facing substantially U-shape cross-section members forming an elongated intra-uterine device holding and guiding element, said members being spaced apart only at a relatively short zone intermediate their ends to form a widened receiving and holding portion for an expanded IUD, said receiving and holding portion being constituted by two opposed and laterally spaced coextensive and uninterrupted intermediate portions of said continuous U-shape cross-section members which latter are otherwise in contact with each other throughout the length of said holding and guiding element.

3,918,446

SECUREMENT DEVICE FOR INTRAVENOUS CATHETER AND ITS TUBING

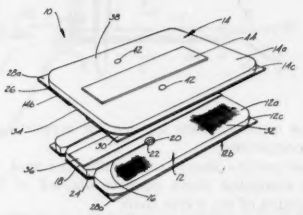
Philip M. Buttaravoli, Annandale, Va., assignor to E-Med Corporation, Cincinnati, Ohio

Filed May 3, 1974, Ser. No. 466,734

Int. Cl.² A61M *05/00, 25/02*

U.S. Cl. 128—133 **19 Claims**

1. A device securable to the skin of a patient for holding in place and protecting an infusion needle or catheter in the puncture site of a body portion of a patient and for holding a portion of the excess tubing while providing a cushion between the catheter tubing assembly and the skin, which comprises top and bottom pads, said bottom pad being formed of flexible material having upper and lower surfaces and having at least one slit extending from one edge inwardly of said bottom pad to a termination point within the confines of said bottom pad; means to affix the lower surface of said bottom pad to the body portion of the patient; said upper pad overlying said bottom pad and being formed of flexible material having upper and lower surfaces; a portion of the lower surface of said upper pad being affixed to a portion of the upper surface of said bottom pad, said portions forming a line of juncture dividing said bottom pad into first and second parts and said upper pad into first and second flaps overlying said first and second bottom pad parts, respectively, said one slit



being located in one of said bottom pad parts; and means to releasably affix substantially the lower surface of said first and second flaps of said upper pad to the upper surface of said first and second bottom pad parts, respectively, whereby in use said slit cradles the infusion needle or catheter and substantially surrounds the puncture site, protecting it from bacterial infiltration, one of said flaps overlying said slit and with said slit in said line of juncture securing the infusion needle or catheter and the tubing behind it over an extended length to secure against lateral and longitudinal movement, and the other of said flaps serving to cover and hold an additional loop portion of the tubing against one of said bottom pad parts to provide a safety loop of the tubing, thereby insulating any shock to the tubing transmitted by the infusion needle or catheter.

3,918,447

VENTILATORS

John S. Inkster, 16 Oaklands, Gosforth Newcastle-upon-Tyne,3, England, and Norman Burn, 61 Tavistock Road, Newcastle upon Tyne, England (NE2 3HY)

Filed Aug. 22, 1973, Ser. No. 390,653

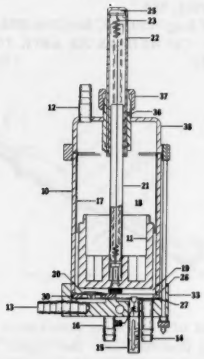
Claims priority, application United Kingdom, Aug. 19, 1972, 38788/72; Feb. 7, 1973, 6025/73

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.8 **3 Claims**

1. A ventilator comprising a cylinder having a piston reciprocally movable therein between a first position and a second position, sealing means disposed between said cylinder and said piston, said sealing means and said piston defining a first compartment and a second compartment within said cylinder, piston guide means having a first tube attached to said piston and a second tube attached to said cylinder, said tubes being concentric, and said first tube being reciprocally movable within said second tube, biasing means within said first compartment urging said piston toward said first position, said biasing means consisting of a coil spring connected to said first tube and to said second tube, said spring being within said first tube and said second tube, and adjustable piston stop means within said first compartment defining said first position, said

first compartment being operably connected to a source of driving gas to move said piston from said first position to said



second position and said second compartment being operably connected to a source of breathing gas and to a patient airway.

3,918,448

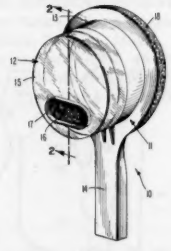
SANITARY FACE MASK

Doris C. McCosker, 9206 Winchester Ave., Margate, N.J. 08402

Continuation-in-part of Ser. Nos. 210,962, Dec. 22, 1971, Pat. No. 3,740,768, and Ser. No. 338,208, March 5, 1973. This application Mar. 11, 1974, Ser. No. 449,854

Int. Cl.[2] A61F *9/00;* **A62B** *7/10*

U.S. Cl. 128—146.6 **3 Claims**



1. In a sanitary face mask for use by an individual during spraying having mask frame means forming a hollow substantially semi-ovoid with a perimeter suitably contoured for a portion of a human face, and separate filter material means removably retained on the mask frame means, the improvement wherein the radially outer surface of an annular edge portion most remote from the suitably contoured perimeter of said mask frame means is complementally configured to the radially inner surface of an annular edge portion of said filter material means, such that said filter material means is adapted for removable retention about said radially outer surface of said mask frame means by means of a force-fit; and wherein the radially inner surface of an annular edge portion most remote from the suitably contoured perimeter of said mask frame means is complementally configured to the radially outer surface of said annular edge portion of said filter material means, such that said filter material means is adapted for removable retention within said radially inner surface of said mask frame means by means of a force-fit; thus providing dual-mode character to said face mask in that said filter material means is adapted to be removably retained on said radially outer surface of said mask frame means and on said radially inner surface of said mask frame means, at the option of one utilizing said face mask.

3,918,449

DEVICE FOR CUTANEOUS THERAPEUTIC TREATMENT

Michel Louis Paul Pistor, Paris, France, assignor to Etablissements A. Guerin and Michel, Louis, Paul Pistor, both of Paris, France

Filed June 5, 1974, Ser. No. 476,531

Claims priority, application France, June 6, 1973, 73.20594

Int. Cl.[2] A61M *5/00;* **A61B** *17/20*

U.S. Cl. 128—218 R **7 Claims**

1. A cutaneous therapeutic treatment device comprising rotary means for rolling along a skin area which is to be treated and fixedly carrying at its exterior surface a plurality of sharply pointed projections for micro-puncturing the skin during rolling of said rotary means therealong, said projections being axially and circumferentially distributed over said exterior surface of said rotary means, a shaft extending through said rotary means and supporting the same for free rotary movement, an elongated body extending parallel to said shaft and means fixing said body to said shaft so that said shaft and body form a unitary structure, said exterior surface of said rotary means being situated between said shaft and elongated body while being spaced together with said projections from said elongated body, the latter being formed with an interior longitudinal bore and with a plurality of ports communicating with said bore and the exterior of said body and directed toward said exterior surface of said rotary means, a syringe, and connecting means connecting said syringe to said elongated body in a manner providing from said syringe a handle for manipulating said unitary structure to roll said rotary means along the skin which is to be treated, said connecting means providing communication means between the interior of said syringe and said longitudinal bore whereby said syringe can be manipulated not only to roll said rotary means along an area of skin to be treated but also to supply to said ports a treating agent to be distributed from said ports not only to said exterior surface of said rotary means and the projections carried thereby but also onto the exterior of the skin which is to be treated.

3,918,450

CATHETER ADAPTER

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Nov. 22, 1974, Ser. No. 526,074

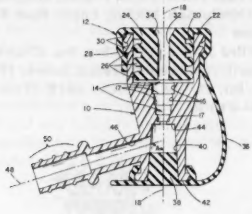
Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—247 **10 Claims**

1. A catheter adapter, comprising

a body member having a first recess for receiving a catheter, said first recess defined, at least in part by a plurality of coaxial cylindrical surfaces of diameters corresponding to a plurality of different standard catheter outer diameters;

a second member formed from a resilient material engaging said rigid body member to enclose said first recess and having an opening therethrough for admitting a catheter to said first recess, said opening being coaxial with said cylindrical surfaces and having a diameter, when said



resilient material is unstressed, no greater than the diameter of the smallest of said cylindrical surfaces;

said plurality of cylindrical surfaces being arranged according to size with the largest diameter cylindrical surface being disposed closest to said opening in said second member.

3,918,451

INHALATOR FOR PULVERULENT SUBSTANCES

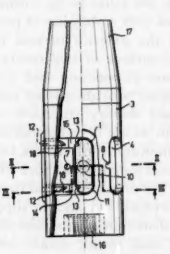
Emeram Steil, Starnberg, Germany, assignor to Paul Ritzau Pari-Werk KG, Germany

Filed Sept. 16, 1974, Ser. No. 506,611

Claims priority, application Germany, Sept. 18, 1973, 2346914

Int. Cl.² B67D *5/54;* **A61M** *13/00, 15/06*

U.S. Cl. 128—260 **18 Claims**



1. An inhalator for pulverulent substances comprising an inhalator case having an inlet and an outlet for passing respiratory air, a reception space formed on the outer periphery of the case for insertably receiving a rupturable capsule containing a pulverulent substance, means for mounting a cover portion on the inhalator case for movement with respect thereto between a first position whereat the cover portion encloses the capsule in the reception space and a second position at which the cover portion uncovers the capsule in the reception space to permit removal and replacement thereof.

3,918,452

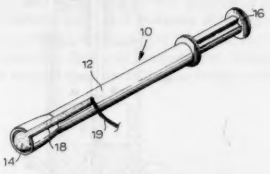
TAMPONS IMPREGNATED WITH CONTRACEPTIVE COMPOSITIONS

Edward Cornfeld, Potomac, Md., assignor to Edward Cornfeld, Silver Spring, Md.

Filed Aug. 1, 1974, Ser. No. 493,831

Int. Cl.² A61F *13/20;* **A61K** *7/00*

U.S. Cl. 128—270 **3 Claims**



1. The method of preventing conception or implantation which comprises inserting into the vagina of a mammal a sponge tampon impregnated with microcapsules having a contraceptive composition prior to exposure to exteriorally inserted fluids and permitting said sponge tampon to remain in the vagina until at least an effective amount of said composition is released and leaving the sponge tampon in the vagina at least during the insertion of said exterior fluids so as to prevent conception or implantation from said fluids.

3,918,453

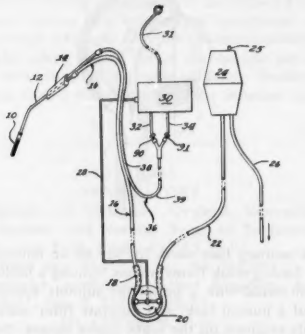
SURGICAL SUCTION DEVICE

Ronald J. Leonard, Elk Grove Village, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed July 1, 1974, Ser. No. 484,649

Int. Cl.² A61M *1/00*

U.S. Cl. 128—278 **10 Claims**

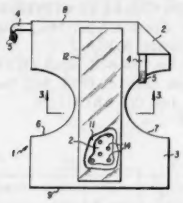


1. In a surgical suction device which comprises a tubular suction member having a suction tip, and a mechanically-operated blood suction pump, the improvement comprising: pressure responsive pump control means for actuating said suction pump upon sensing a first pressure level, and for shutting said pump off upon sensing a second pressure level, a pressure conduit, other than said suction member, communicating with said pressure responsive pump control means for providing pressure for sensing by said control means, said pressure conduit extending to a position adjacent said suction tip; and means for varying and controlling, from a position adjacent said suction tip, the pressure within said pressure conduit to correspondingly control the operation of said suction pump.

3,918,454
SOILAGE-INDICATING DIAPER

Miklos B. Korodi, 440 E. 79th, New York, N.Y. 10021, and Frederic C. Dreyer, 2111 Jeff. Davis Hwy., Arlington, Va. 22202

Filed Mar. 2, 1973, Ser. No. 337,767
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 5 Claims

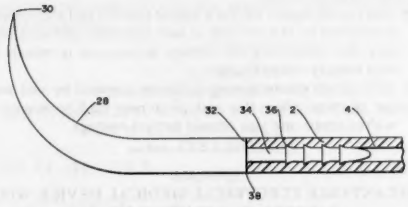


1. A soilage-indicating diaper having an absorbent body,
opposed waist portions adapted to cover ventral and dorsal areas of the body,
a crotch area in said body and joining said waist portions, an indicating layer of bibulous material adjacent the outer surface of the absorbent body extending between the waist portions and through said crotch area,
said bibulous layer being impregnated with indicator means for causing a visible indication upon soilage of said body, means for exposing a portion of said bibulous layer through said absorbent body, said exposure means including
at least one aperture through said absorbent body, and a portion of said bibulous material being positioned within said absorbent body aperture.

3,918,455
COMBINED SURGICAL SUTURE AND NEEDLE

Myron J. Coplan, Natick, Mass., assignor to Albany International Corporation, Dedham, Mass.

Continuation-in-part of Ser. No. 464,810, April 29, 1974, abandoned. This application May 31, 1974, Ser. No. 475,102
Int. Cl.[2] A61B *17/06*
U.S. Cl. 128—339 10 Claims

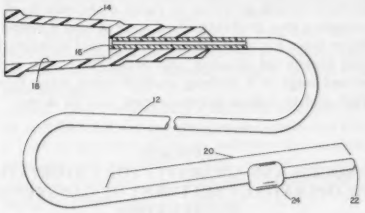


1. In combination, a suture and needle joined together, the suture comprising a length of monofilament having an internal bore and having an external predetermined peripheral shape of predetermined first dimensions; the needle comprising a needle end portion and a shank end portion, the needle end portion extending from a point at one end thereof to a shoulder at the other end thereof, the periphery of the needle at the shoulder having the same shape as said first peripheral shape and having corresponding cross-sectional dimensions no less than said first dimensions; the shank end portion extending from the shouldered end of the needle end portion and being of predetermined dimensions and shape smaller than the external dimensions of the suture, said shank end portion being inserted into and held in said bore with the end of the suture abutting said shoulder in close engagement therewith.

3,918,456
CATHETER UNIT FOR CHOLANGIOGRAPHY

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Nov. 19, 1974, Ser. No. 525,053
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 5 Claims

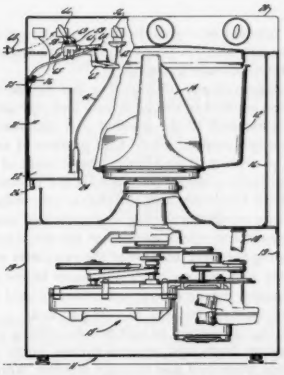


1. A catheter unit for use in operative cholangiography comprising a transparent elongated conduit member having a rounded, open distal end for insertion into a body cavity and an open proximal end, and a transparent adapter in leak-proof engagement with said conduit member adjacent said proximal end, said adapter including a recess communicating with said proximal end whereby a source of fluid may be placed in said recess for the transmittal of fluid to said conduit member, said conduit member including a smoothly rounded enlargement thereof set back from said distal end, a distance of between about 3/16 inch and about one inch, whereby when said enlargement is located in the cystic duct of a patient said distal end will be located in the common duct of the patient.

3,918,457
WATER LEVEL CONTROL FOR WASHING MACHINES

Karlis V. Racenis, Ripon, Wis., assignor to McGraw-Edison Company, Ripon, Wis.

Filed May 3, 1973, Ser. No. 356,742
Int. Cl.[2] F16K *21/18*
U.S. Cl. 137—387 6 Claims



1. In a pressure-independent water level control assembly for a washing machine, the improvement whereby said assembly is remote from the washing machine tub so that said assembly never comes in contact with any medium other than water, comprising:
means for splitting a stream of water into a main stream for admission to said tub, and a slip stream,

a vertically elongated tank receiving said slip stream of water when water is being admitted to a washing tub in said machine, said slip stream of water being the only medium admitted to said tank,

an air dome having a lower opening communicating with a lower portion of said tank to thereby develop a pressure in said dome corresponding to the height of water in said tank,

a pressure-responsive switch communicating with an upper portion of said air dome to signal a pressure level corresponding to a predetermined level in said washing tub,

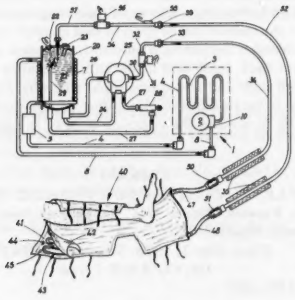
a drain valve for draining water from said elongated tank, and means for opening said drain valve at a predetermined stage in a washing cycle to drain water from said tank and to release pressure from said air dome.

3,918,458

PROCESS AND APPARATUS FOR CRYOSTATIC PRE-OPERATIVE TREATMENT OF GANGRENOUS EXTREMETIES

Howard J. Nethery, 200 Pennsylvania Ave., Louisville, Ky. 40206

Filed Oct. 7, 1974, Ser. No. 512,693
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—400 **8 Claims**



1. In a process of cryostatic pre-operative treatment of a gangrenous extremity in preparation for the subsequent surgical amputation of said extremity,

a. the improvement of lowering the temperature of the affected portion of the extremity and providing refrigeration anesthesia to the patient and ultimately providing physiologic amputation of said portion of said extremity while providing to said patient movement of said extremity and limited ambulation during the period of said pre-operative treatment and simultaneously reducing nursing care to a minimum during said period of said pre-operative treatment, which comprises the steps of:

b. wrapping the affected part of the extremity with a flexible freezing pad, having inner and outer layers and containing sinuous tubing interposed between said layers which covers most of the area of said pad and

c. supplying refrigerant to said sinuous tubing and removing refrigerant from said sinuous tubing from a from some distance from said pad through flexible tubing extending from said source to said pad and from said pad to said source and which forms a closed circuit with said source and said pad;

d. circulating said refrigerant through said sinuous tubing at subfreezing temperatures for sufficient time to completely freeze the wrapped gangrenous extremity and to effect physiologic amputation of said extremity by completely cutting off circulation between the affected part of said extremity and the rest of the body;

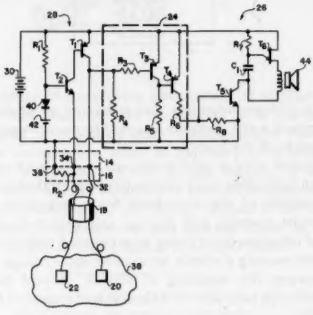
e. thereafter, raising the temperature of the circulating refrigerant to a freezing holding temperature for sufficient time to maintain the extremity in frozen condition until the patient gains sufficient strength to undergo surgical amputation.

3,918,459

CONSTANT CURRENT ELECTROTHERAPY DEVICE WITH PLUG-IN CURRENT CONTROL MEANS

Anton James Horn, Creve Coeur, Mo., assignor to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 244,843, April 17, 1972, abandoned.
This application Jan. 16, 1974, Ser. No. 433,923
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 R **4 Claims**



1. A low intensity direct current device for electrotherapy uses comprising:

a. an electrical circuit means for producing a constant direct current of a predetermined value within a range of currents which promotes healing when passed through tissue containing a skin lesion, said circuit means having a pair of output terminals;

b. a cable for conducting the direct current produced by said circuit means to a patient, said cable having a socket at one end for connection to said terminals and a pair of electrodes at its other end for attachment to a patient;

c. a battery connected to said circuit means for powering said circuit means;

d. said circuit means having a sensor portion and electrically connected to at least one of said terminals and said battery, for comparing the voltage across said terminals to said battery voltage; and

e. said circuit means having an alarm actuated by said sensor portion when the voltage across said terminals is within about one volt of said battery voltage.

3,918,460

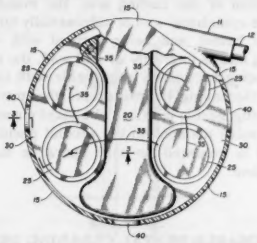
IMPLANTABLE ELECTRICAL MEDICAL DEVICE WITH BATTERY GAS VENTING MEANS

Wendell L. King, Isanti, and Kenneth B. Stokes, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed July 5, 1974, Ser. No. 485,951
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P **10 Claims**

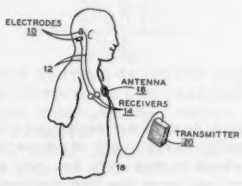
1. An implantable electrically powered medical device, comprising, at least one electrochemical generating cell which produces a gas upon discharge, an electric power actuated device connected to said cell and energized therefrom, a spacer having recesses therein to mount and confine said cell and said device, said spacer being formed of a plastic material having good permeability to hydrogen gas relative to epoxy resins, means connected to the device and providing an output therefrom, a covering of epoxy resin material positioned over

and encapsulating said spacer with said cell and device therein, and with the means connected to the device extending therethrough in sealed relationship therewith, and hydrogen



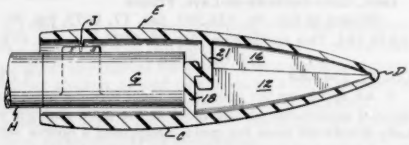
permeable means contacting said spacer and extending through said epoxy resin covering defining a conduit for hydrogen gas from the cell through said epoxy resin covering.

3,918,461
METHOD FOR ELECTRICALLY STIMULATING THE HUMAN BRAIN
Irving S. Cooper, 4422 Third Ave., Bronx, N.Y. 10457
Filed Jan. 31, 1974, Ser. No. 438,433
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—422 **7 Claims**



1. A method of stimulating the human brain comprising the steps of: affixing at least one set of electrodes directly to a region of the cerebellum; generating electrical pulses having a duration of from 0.5 to 2.5 milliseconds, an amplitude of from 0.5 to 14.0 volts and a frequency of from 1 to 300 pulses per second; and applying the generated electrical pulses to said electrode.

3,918,462
CIGARETTE PIERCING DEVICE
Kari A. Laitio, 2041 W. 164th St., Gardena, Calif. 90427
Filed Mar. 10, 1975, Ser. No. 556,664
Int. Cl.[2] A24F *47/00*
U.S. Cl. 131—170 R **5 Claims**



1. A one-piece molded device for sequentially forming one or a plurality of circumferentially spaced openings in a cylindrical filter-defining end portion of a cigarette to admit air from the ambient atmosphere into smoke passing through said filter-defining end portion prior to said smoke entering a user's mouth, said device including:

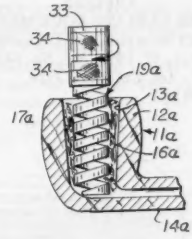
a. first and second elongate members of transverse channel-shaped cross section formed from a rigid but resilient polymerized resin, each of said first and second elongate members having first and second ends, with said first and second elongate members on said second ends merging into one another to provide a hinge, and with said first ends of said first and second elongate members, due to the resiliency of said resin, at all times tending to pivot away from one another, with the interior of said first elongate member being of greater width than the external transverse width of said second elongate member, and said first elongate member being longitudinally disposed to overlie said first elongate member;

b. first means formed as a part of said first and second elongate members for limiting the pivotal movement of said second elongate member relative to said first elongate member;

c. second means operatively associated with said first ends of said first and second elongate members and formed as a part of said first elongate member for centering said filter-defining end portion between said first and second elongate members, with said filter-defining end portion being rotatable when so centered; and

d. a tapered prong that extends from the interior of said second elongate member adjacent said first end thereof and formed as a part thereof, said prong not being in contact with said filter-defining end portion when said first and second elongate members are in said first position, but said prong piercing said filter-defining end portion to form an opening therein when said second elongate member is moved from said first position to a second position, and a series of said openings being formed in said filter-defining end portion when the latter is intermittently rotated and said second elongate member is alternately moved between said first and second positions.

3,918,463
MEANS AND METHOD FOR DIRECTING TOBACCO TOWARD THE WALL OF A PIPE BOWL TO IMPROVE BURNING ACTION
Herbert A. Lebert, 25 Windsor Drive, Hillsborough, Calif. 94010
Filed June 28, 1974, Ser. No. 484,142
Int. Cl.[2] A24F *47/00*
U.S. Cl. 131—172 **2 Claims**

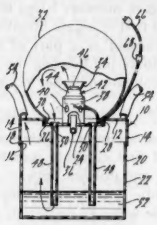


1. A method of improving burning action of smoking pipes comprising inserting in the bottom of the bowl of the pipe a conical member, filling the bowl of a pipe with tobacco, moving the tobacco radially outward toward the bowl wall so that the tobacco is initially more dense around the bowl wall than at the central axis of the bowl by pulling said conical member upward from the bottom of the bowl while holding tobacco in the bowl with the fingers to prevent tobacco from falling out of the top of the bowl, and then burning the tobacco, thereby causing some of the tobacco to move back toward the central axis so that the density of the tobacco is nearly uniform throughout the cross-section of the bowl.

3,918,464
SMOKING DEVICE

Kenneth W. Kolodziej, 25991 Rouge Court, Southfield, Mich. 48075

Filed Aug. 24, 1973, Ser. No. 391,300
Int. Cl.² A24F *1/30*
U.S. Cl. 131—173 9 Claims

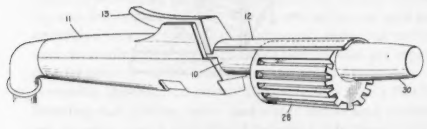


1. A smoking device comprising a housing defining a three-dimensional manifold, a bowl mounted on the upper end portion of an upright hollow tubular member supported adjacent to its lower end by said housing, said bowl adapted to contain tobacco to be burned, an enclosure removably mounted in substantial sealing engagement on said housing for enclosing said bowl and said hollow member and forming a smoke collection chamber, said hollow member formed with at least one port in the side wall thereof below said bowl for providing communication between said chamber and the interior of said hollow member, means disposed in communication with the atmosphere exteriorly of said housing for supplying outside air into the interior of said hollow member for supporting combustion of the tobacco in said bowl, port means disposed in communication with said chamber and said manifold for passage of smoke and air from said chamber to said manifold, a plurality of smoking tubes connected to said housing and having one end thereof disposed in communication with said manifold for withdrawing smoke therefrom, and flow control means in each of said smoking tubes for permitting flow of smoke and air only in a direction outwardly of said tube and manifold.

3,918,465
HAIR CURLING EQUIPMENT

George Barradas, 15 Riverview Court, Glenville, Conn. 06830

Filed Jan. 27, 1975, Ser. No. 543,997
Int. Cl.² A45D *2/24*
U.S. Cl. 132—37 R 10 Claims



1. In combination with a steam curling iron having a curling arm and a clamping arm, the curling arm having an operative section constituted by a tubular barrel housing steam generating means, the clamping arm being adapted in the clamped position to engage a longitudinally extending upper region of the barrel, and the barrel having a lower region formed with perforations to permit the escape of steam therefrom:

i. a valve member mounted within the barrel, the valve member being displaceable between a first position at which it closes said perforations to block the escape of steam and a second position at which it uncovers the perforations,

ii. spring means biasing the valve member to said first position;

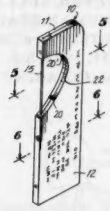
iii. abutment means connected to the valve member,

iv. a tubular mandrel adapted to be mounted on said operative section of the curling arm, the mandrel having a perforate cylindrical wall of substantially larger diameter than the barrel, and being formed with resilient arm engaging means interiorly of said wall, the arm engaging means being frictionally engageable with the barrel and slidable therealong, the mandrel further providing an end portion engageable with said abutment means for displacing the valve member to the second position when the mandrel is mounted on said operative section of the curling arm.

3,918,466
DISPOSABLE DENTAL CLEANING DEVICE

John G. Peebles, Jr., New York, N.Y., assignor to JKC Products, Inc., New York, N.Y.

Filed July 17, 1974, Ser. No. 489,339
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 8 Claims



1. A disposable dental floss cleaning unit comprising a panel having a score line therein, a pair of substantially symmetrical side walls defined by said score line, said side walls being foldable about said score line into confronting relationship along respective underside surfaces thereof, said confronting underside surfaces of said respective side walls being fixedly connected, one to the other, a removable area of said panel defined by a continuous score line within the body of said panel, means for releasably connecting said removable area of said panel to the body of said panel, and at least one length of dental floss having opposed ends fixedly connected to said panel, at least a portion of said dental floss being strung across said removable area of said panel.

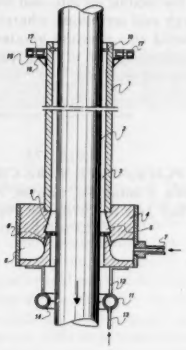
3,918,467
APPARATUS FOR THE COOLING OF A CONTINUOUSLY CAST PRODUCT

Robert Alberny, and Alain Leclercq, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Division of Ser. No. 324,367, Jan. 17, 1973, Pat. No. 3,820,584. This application May 28, 1974, Ser. No. 473,334
Int. Cl.² B08B *3/02*
U.S. Cl. 134—64 7 Claims

1. An apparatus for cooling an ingot-forming mass from a vertical continuous casting mold as the mass emerges vertically downward from the mold, comprising a hollow vertical casing having an inner cross-sectional area of a shape similar to the cross-sectional area of said mass and larger than the cross-sectional area of said mass, said casing being positioned to extend coaxially with the mass over a given length whereby the mass may pass downwardly through said casing, and a supply head positioned coaxially on the lower end of said casing, said supply head having an annular chamber, means for emitting a supply of pressurized liquid cooling medium to said annular chamber, said supply head further having an axial

opening at its upper end aligned with the inside of said casing, said axial opening having a conical recess with a vertical extending axis, the larger diameter end of said conical recess extending downwardly, and a plurality of apertures extending



upwardly from said annular chamber to the bottom of said conical recess, whereby coolant fluid emitted to said annular chamber under pressure is directed upwardly in the space between said casing and said mass in which it is moved with a high speed.

3,918,468

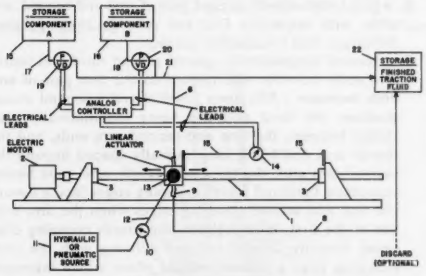
APPARATUS FOR TESTING TRACTION COEFFICIENT AND METHOD OF USE THEREOF

Richard J. Stenger, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 320,357, Jan. 2, 1973, Pat. No. 3,839,897. This application Oct. 2, 1974, Ser. No. 511,396

Int. Cl.² G05D *11/00*

U.S. Cl. 137—3 **3 Claims**



1. A continuous process for preparing a traction fluid comprising a blend of at least two fluids of different traction coefficients subject to variation from time to time which comprises:

a. blending streams of said two fluids in a ratio adapted to produce a blend having a selected traction coefficient;

b. passing at least a portion of the blend through a thrust force measuring device comprising:

1. A linear actuator in a housing having means for conducting said liquid traction fluids thereto and therefrom, said actuator being mounted on and tractionally movable along a smooth rotatable drive shaft axially thereof, means in the actuator for conducting said fluids between said actuator and said drive shaft;

2. means attached to said housing adapted to measure the thrust force generated by movement of said actuator along said drive shaft;

c. and altering the ratio of said streams as changes in their traction coefficients occur to maintain a constant thrust by the thrust force measuring device.

3,918,469

CONTROLLING CONCENTRATION OF ADDITIVE IN AN EVAPORATIVE SYSTEM

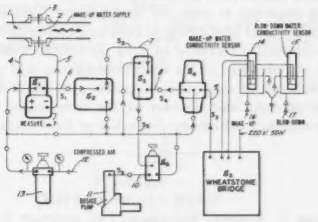
Leopoldo Zamboni; Mauro Minervini, and Marcello Zifferero, all of Rome, Italy, assignors to Nalco Chemical Company, Chicago, Ill.

Filed Apr. 11, 1974, Ser. No. 459,918

Claims priority, application Italy, Nov. 27, 1973, 52806/73

Int. Cl.² G05D *11/08*

U.S. Cl. 137—5 **12 Claims**



12. A method for continuously controlling the dosage of a chemical additive in an evaporative system including both make up water and blow down water, and comprising the steps of:

a. continuously measuring the make up water flow rate (F_m) and originating an analog indicating the measured rate of flow;

b. continuously measuring the ratio K_m/K_s of the relative conductivities of the make up water and of the blow down water and originating an analog indicative of the measured ratio;

c. multiplying said two analogs indicative of the values of F_m and of K_m/K_s and originating an analog of the product;

d. and, in accordance with said product, varying the delivery of a variable pump for feeding the chemical additive.

3,918,470

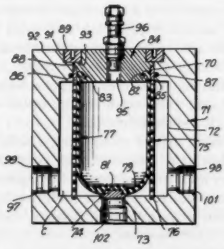
RELIEF AND UNLOADING VALVE

Alphonse A. Jacobellis, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Division of Ser. No. 194,852, Nov. 2, 1971, abandoned, which is a division of Ser. No. 112,037, Feb. 17, 1970, Pat. No. 3,636,969. This application May 17, 1974, Ser. No. 470,800

Int. Cl.² G05D *11/00*

U.S. Cl. 137—115 **1 Claim**



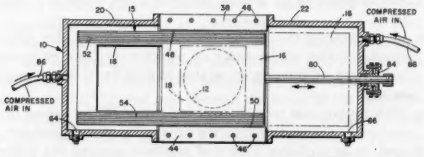
1. A valve for controlling relief of fluid under pressure in a hydraulic system, said valve comprisng a casing having a cylindrical chamber therein, a pressure inlet port extending laterally into said casing chamber at one end thereof, said

chamber having a reduced diameter axial bore at one end defining a valve seat at its inner end and a relief port at its outer end, said chamber having a deformable bladder positioned therein and extending axially thereof, means to charge said bladder with gas under pressure, a cylindrical perforated sleeve positioned in said chamber and extending the full length thereof coaxial with said relief port and valve seat and encompassing the latter, and spaced inwardly from the cylindrical wall of said chamber, said bladder having a mouth at one end and being closed at its other end, said bladder being positioned axially in said sleeve, the means to charge said bladder further including means to securely retain the mouth of said bladder and said sleeve in fixed position at the other end of said chamber, a valve member secured to the bladder at its closed end positioned to be pressed against said seat, a pressure outlet port extending laterally outwardly from said casing chamber at said one end thereof, said pressure inlet port and outlet port being in communication and leading into said chamber exteriorly of said perforated sleeve, whereby when the pressure of the fluid flowing into said pressure inlet port and out of said pressure outlet port exceeds a predetermined amount, said bladder will be compressed to move said valve member off its seat for relief of fluid under pressure.

3,918,471
GATE VALVE DEVICE

Michael P. Bedner, Monessen, Pa., assignor to Bernard S. Shire; Jack L. Bergstein; Franklin L. Bialon and Harold J. Hazelbaker, all of Monessen, Pa.

Filed May 23, 1973, Ser. No. 362,881
Int. Cl.² F16K *3/36, 29/00*
U.S. Cl. 137—238 **2 Claims**



1. A trackless gate valve device disposed between and in combination with in-line inlet conduit means of a pressurized system and feed conduit means whereby fluid material can be fed to said pressurized system through said in-line feed means and inlet means and regulated by said device, said valve device comprising an elongated, sealed housing, gate valve means, and air pressure feed means,

a. said housing disposed transverse to said in-line feed and inlet means and comprising a coextensive elongated rectangular chamber in open communication with said feed and inlet means; said housing comprising rectangular end sections connected to a midsection which contains opposing flange members to which said inlet means and said feed means are respectively connected; said opposing flange members connected by upper and lower plate members having flat inner surfaces which provide seat means for said gate valve means upon which said gate valve means is slidably moved;

b. said gate valve means comprising a solid gate valve disposed within said chamber and adapted to be moved reciprocally and slidably therein; said gate valve comprising an elongated, rectangular plate having a rectangular open section near one end thereof; said open section having a similar cross-sectional area as said feed means, whereas the other end of said gate valve is solid and has a cross-sectional area adequate to close said feed means; said gate valve comprising a plurality of longitudinal serrations disposed along the entire length of the top, bottom and sides adjacent said top and bottom, which provide restricted air passages therealong and which provide reduced friction for slidably moving said gate valve in said seat means;

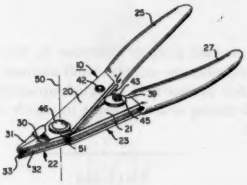
c. means for moving said gate valve means slidably within said chamber between an open and closed position;

d. air pressure feed means disposed at both ends of said chamber for feeding air into said rectangular end sections and through said serrations, whereby said entire chamber is maintained at a pressure greater than the pressure in said pressurized system in both open and closed positions of said gate valve.

3,918,472
PLIERS-TYPE WIRE-CRIMPER

Frank R. Brown, Clinton St., Antrim, N.H. 03440

Filed July 8, 1974, Ser. No. 486,465
Int. Cl.² B21F *1/04*
U.S. Cl. 140—106 **9 Claims**



1. A wire crimper for crimping a longitudinally elongated wire comprising:

A. a first longitudinally spaced pair of first and second arm ends, with respective first and second crimping edges defining a first longitudinal plane;

B. a second longitudinally spaced pair of third and fourth arm ends movable with respect to the first pair of arm ends between a first open position and a second closed position, the third arm end being longitudinally positioned between the first and second arm ends, and the fourth arm end being longitudinally spaced beyond the second arm end, the third and fourth arm ends having respective third and fourth crimping edges facing toward the first and second crimping edges when the arm ends are in the first open position, the fourth crimping edge being laterally offset from and defining with the third crimping edge a skewed second plane which intersects the first plane, positioning the fourth crimping edge near but not intermeshed with the second crimping edge and positioning the third crimping edge intermeshed between the first and second crimping edges when in the second closed position of the arm ends; and

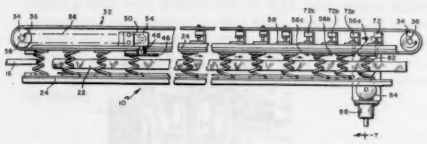
C. means for moving the second pair of arm ends with respect to the first pair of arm ends between the first open position and the second closed position;

whereby a wire placed between the opposing crimping edges when the arm ends are in the first open position is forcibly crimped by movement of the arm ends toward the second closed position, being deformed in undulant fashion around the first, second and third crimping edges while restrained by the fourth crimping edge so that the wire portion adjacent the fourth crimping edge remains substantially straight and undisturbed after the arm ends are retracted from the second closed position.

3,918,473
COIL TRANSFER APPARATUS

Henry R. Ramsey, Dudley, Mass., assignor to Webster Spring Co. Inc., Dudley, Mass.

Filed June 10, 1974, Ser. No. 477,592
Int. Cl.² B21F *27/16*
U.S. Cl. 140—3 CA **15 Claims**

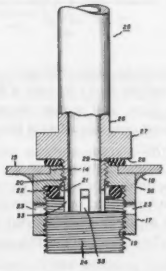


1. Coil transfer apparatus comprising a channel having a bottom support and spaced parallel sides for receiving at one end horizontally displaced coils from a coiler with the ends engaged between the sides, continuously moving belt means along one side for advancing the horizontally displaced coils presented to the channel at said one end toward the other end, a gutter along the other side with which the end loops at the ends of the coils are slidingly held engaged as the coils are advanced for holding the coils in a predetermined position, positioning means at the distal end of the channel for stopping the first coil of a group of a predetermined number of coils to be advanced along the channel at a predetermined position, means at said position for rotating the first coil about its horizontal axis to reverse the position of the knots and projecting a second positioning means into the channel to stop the next coil in succession at a predetermined distance from the first coil, and means for successively projecting additional positioning means into the channel in succession to stop coils at predetermined positions to form a procession of a predetermined number of coils.

3,918,474
CAPACITOR FILL TUBE AND SEAL

John A. Supancic, Jr., Proctor, Vt., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation of Ser. No. 282,984, Aug. 23, 1972, abandoned.
This application Apr. 15, 1974, Ser. No. 460,790
Int. Cl.² B65B *39/00*
U.S. Cl. 141—98 **7 Claims**



1. A capacitor casing fill tube and seal means comprising in combination

a. a sleeve member adapted to be positioned in one wall of a capacitor casing and projecting inside of said casing,

b. an internal shoulder means in said sleeve member and defining a pair of coaxial and threaded smaller diameter upper and larger diameter lower apertures,

c. a threaded plug seal in said lower aperture,

d. said sleeve member having a lateral aperture in the wall thereof which is coverable and uncoverable by rotation of a plug seal in said sleeve member,

e. fill tube wrench engagement means on said plug seal and adapting said plug seal to abut said internal shoulder,

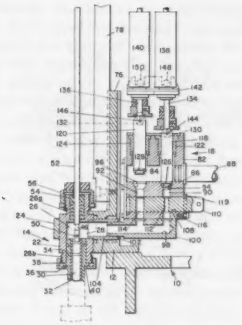
f. and fluid sealing means between said plug seal and said internal shoulder and adapted to be compressed in fluid tight relationship when said plug seal is rotated to move axially in a direction towards the outside of said casing subsequent to covering said coverable and uncoverable opening,

g. and a fill tube wrench means adapted to engage said fill tube wrench engagement means on said plug and rotate said plug seal to pass fluid through said opening into said casing.

3,918,475
CONTROL FOR FILLING MACHINE

William H. Trusselle, Braintree, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Continuation of Ser. No. 186,031, Oct. 4, 1971, abandoned.
This application Oct. 26, 1973, Ser. No. 410,115
Int. Cl.² B65B *3/26*
U.S. Cl. 141—128 **9 Claims**



1. In a filling machine, a machine frame, a plurality of filling heads including nozzles extending downwardly therefrom and a corresponding number of container supports, means supporting the filling heads and container supports with the nozzles centered above the supports for rotation about a vertical axis, means for supplying empty containers to the container supports and pneumatically operative means for effecting relative movement of the filling heads and container supports to position the nozzles within the containers adjacent to the bottoms for filling and withdrawal following filling, each filling head having a pneumatically operable supply valve operative to supply liquid to each nozzle through its associated filling head, said pneumatically operable supply valve containing a primary passage through which liquid is adapted to flow at a relatively slow rate throughout the filling operation and a secondary passage through which additional liquid is adapted to flow during the period between initiating the filling operation and terminating the filling operation, said pneumatically operable supply valve including a first valve element operable to open and close the primary passage to commence and terminate the filling operation and a second valve element in the secondary passage to open and close the secondary passage while the liquid continues to flow through the primary passage, a pneumatic control circuit within which the pneumatically operable means and the pneumatically operable supply valve are included, a first trip valve in the control circuit operable at a predetermined place in the rotation of the filling heads and container supports to effect operation of the pneumatically operable means and simultaneously the pneumatically operable supply valve to open the first valve element simultaneously with the movement of the nozzle to said position adjacent the bottom of the container, a second trip valve operable to effect operation of said pneumatically operable

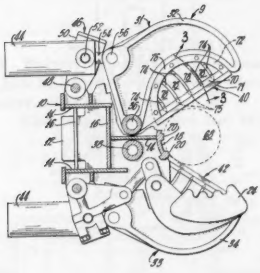
supply valve at said position of the nozzle adjacent the bottom of the container to open the second valve element and sensing means included in the control circuit supported together with the nozzle within the container and movable into and out of the container with the nozzle, said sensing means being operative when the liquid rises in the container to a predetermined level to effect operation of the pneumatically operable supply valve to close the second valve element to terminate the supplemental flow through the secondary passage without terminating the flow through the primary passage and thereafter to effect operation of the pneumatically operable supply valve and the pneumatically operable means, to close the first valve element to terminate the flow through the primary passage and withdraw the nozzle from the container.

3,918,476

SHEAR BLADE

Stanley C. Jasinski, Woodstock, Canada, assignor to Eaton Yale Ltd., Woodstock, Canada

Filed June 3, 1974, Ser. No. 475,472
Int. Cl.² A01G *23/08*; B26D *1/30*
U.S. Cl. 144—34 E **5 Claims**



1. In a tree shear including at least one shear blade assembly and means for moving said shear blade assembly into shearing engagement with a standing tree to be cut: a blade structure comprising a horizontally oriented primary blade member; a plurality of secondary vertically oriented blade members fixed at one end to and spaced apart along the underside of said primary blade member; and a mounting flange fixed to the opposite ends of said secondary blade members for attaching said blade structure to said shear blade assembly; said primary blade member, said secondary blade members and said mounting flange being arranged to provide a plurality of open spaces disposed between said primary blade member and said mounting flange and separated by said secondary blade members.

3,918,477

BACKFLOW PREVENTING DEVICE

Guenter A. Grams, Costa Mesa, Calif., assignor to Surgical Mechanical Research, Inc., Newport Beach, Calif.

Filed Sept. 3, 1974, Ser. No. 502,792
Int. Cl.² F16K *24/02*
U.S. Cl. 137—218 **6 Claims**

1. A backflow preventing device, comprising:

a. a housing structure defining a valve chamber having an inlet port, an outlet port, and an access opening;

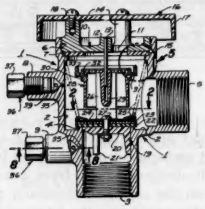
b. an inlet valve for the inlet port;

c. a vent disk fitting the access opening and having a vent opening;

d. a vent valve for closing the vent opening in response to positive pressure in the valve chamber;

e. means connecting the inlet valve and vent valve for movement in unison during closure of the vent valve;

f. and ported yieldable means integral with the vent valve, for removal and replacement as a unit therewith, projecting axially therebeyond for engaging the vent disk during closing and opening the vent valve to permit reduced flow across the vent valve immediately prior to seating of the vent valve and immediately subsequent to opening of the vent valve.



4. The combination with a backflow preventing device including a housing structure defining a valve chamber having an inlet port, outlet port and a vent opening provided with a peripheral seat, an inlet valve for the inlet port, of a vent valve means comprising:

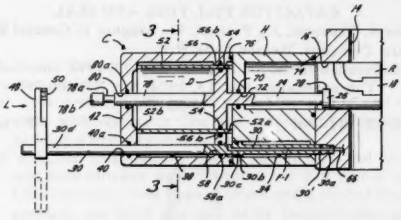
a. a supporting disk connected to the inlet valve for movement in unison therewith;

3,918,478

BLOWOUT PREVENTER WITH LOCKING MEANS

Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company

Filed Feb. 11, 1974, Ser. No. 441,380
Int. Cl.² E21B *33/06*
U.S. Cl. 137—315 **7 Claims**



1. A blowout preventer, comprising:

a. a blowout preventer body having a bore through which well pipe may pass, and a ram opening through a wall thereof on at least one side of said bore and communicating with said bore;

b. a ram for said ram opening;

c. a bonnet detachably connected to said body over said ram opening and adapted to receive said ram when it has been moved to an open position out of said bore;

d. an operating cylinder connected to said bonnet and movable therewith;

e. a piston connected to said ram and operably disposed in said cylinder for relative movement with respect to said body in response to fluid pressure when said bonnet is connected to said body to move said ram between a closed position wherein said ram extends into said bore in said body and an open position wherein said bore is unobstructed and said ram is disposed outwardly of said ram opening of said body, said piston having a piston rod formed therewith extending outwardly through an opening formed in said cylinder;

f. body rod means mounted with said body for supporting said bonnet when said bonnet is in the ram-exposed position;

g. pressure means for supplying fluid pressure to said cylinder to cause relative movement between said piston and said cylinder, said pressure means including a fluid passage formed in said body rod means for communicating with said cylinder and supplying fluid pressure thereto; and

h. locking means mounted with said body rod means for locking with said piston rod to lock said piston against movement with respect to said body whereby said bonnet can be detached from said body and moved away therefrom to a ram-exposed position by supplying fluid pressure into said cylinder to thereby expose ram for removal or repair.

3,918,479

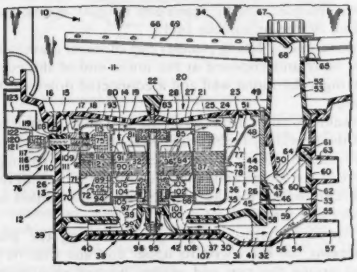
HEAT SYSTEM FOR DISHWASHER

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Continuation-in-part of Ser. No. 195,197, Nov. 3, 1971, Pat. No. 3,750,951. This application Dec. 11, 1972, Ser. No. 313,659

Int. Cl. H02k *1/32, 9/00*

U.S. Cl. 137—340 **28 Claims**



1. Dishwasher apparatus comprising a tub portion and a pump housing portion; means within said housing portion for distributing a washing liquid therein to said tub portion for the washing of dishes or the like in the latter; a motor within said housing portion, said motor having a stator and a relatively movable rotor, and a jacket enclosing said stator and said rotor, said jacket being substantially filled with an electrically non-conductive second liquid, said motor being positioned in said housing portion to permit the washing liquid to pass in heat transferral contact with said jacket for appreciably elevating the temperature of the washing liquid for washing and sanitizing; and pump means operatively connected with said rotor for pumping said washing liquid under pressure to said distributing means.

26. An electric motor comprising a substantially liquid filled jacket, a relatively fixed stator positioned in said jacket, rotatable rotor means positioned in said jacket means for rotation about a longitudinal axis, a gap formed between said stator and said rotor means, and means for circulating the liquid throughout said jacket including apertures extending through said rotor means in a direction substantially parallel to said longitudinal axis, whereby upon energization of said electric motor said rotor means rotates about said longitudinal axis thereby circulating the liquid throughout said jacket.

3,918,480

DEVICE FOR FEEDING GASES TO A FLAME CUTTING MACHINE

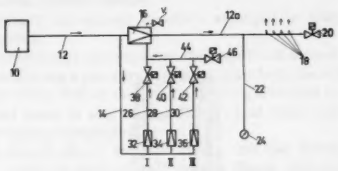
Heinz Leo, Seulberg, Taunus, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Sept. 13, 1973, Ser. No. 397,105

Claims priority, application Germany, Sept. 25, 1972, 2247012

Int. Cl.[2] **G05D** *16/00*

U.S. Cl. 137—488 **2 Claims**

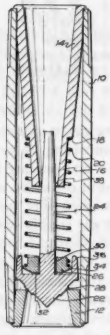


1. a device for feeding gas to a cutting machine with at least one cutting means, comprising, in combination, a source of gas supply, a main pipe line leading from said source of gas supply, a control and shut-off valve means in said main pipe line dividing said main pipe line into an upstream portion between said source of gas supply and said control and shut-off valve means and a downstream portion between said control and shut-off valve means and the cutting means, said control and shut-off valve means having an upstream side connected to said upstream portion of said main pipe line and having a control side downstream from said upstream side for controlling the amount of gas flowing therethrough into said downstream portion of said main pipe line, said downstream portion of said main pipe line leading from said control and shut-off valve means to the cutting means without any further shut-off valve therebetween, said control and shut-off valve means functioning for selectively opening and regulating and closing the flow of gas to the cutting means, a main control circuit having an upstream end and a downstream end, said upstream end being connected in flow communication to said upstream portion of said main pipe line, said downstream end being connected in flow communication to said control side of said control and shut-off valve means, said selective opening and regulating and closing of said control and shut-off valve means being in dependence with the pressure of the gas flowing through said main control circuit and to said control side of said control and shut-off valve means, said main control circuit having a plurality of parallel branch lines, each of said branch lines having an upstream end and a downstream end, the upstream ends of said branch lines being interconnected with each other and the downstream ends of said branch lines being interconnected with each other, each of said branch lines incorporating a control unit therein, each of the control units comprising a pressure regulator and a control valve for determining the control pressure flowing from its branch line to said control and shut-off valve means, a cross line extending across said branch lines and in flow communication therewith, said cross line being in flow communication with said control side of said control and shut-off valve means to comprise the connection of said main control circuit with said control and shut-off valve means whereby the pressure on said control side of said control and shut-off valve means is determined by the total pressure in said cross line from said branch lines, a vent valve in said cross line downstream from the pressure regulators and control valves of said branch lines control units, and said cross line having no valves between said vent valve and said control side of said control and shut-off valve means to render said control and shut-off valve means capable of immediate closing action in its function as a cut-off valve without any residual pressure between said control side and said branch lines control units to affect the subsequent re-opening of said control and shut-off valve means in its subsequent function as a regulating valve.

3,918,481
GAS SUPPLY APPARATUS

Ernest Edward Doe, Chesterfield, and David Cowlishaw, Ranby, both of England, assignors to The Bryan Donkin Company Limited, Chesterfield, England

Filed Aug. 26, 1974, Ser. No. 500,355
Claims priority, application United Kingdom, July 16, 1974, 31521/74
Int. Cl.[2] F16K *21/02*
U.S. Cl. 137—504 4 Claims



1. A flow limiting device for fitment in a gas supply line comprising:

a body part having a bore extending therethrough;

a valve seat formed within said bore;

a valve assembly located in said bore, said assembly moving axially in said bore in response to variations in the rate of flow of gas through said bore, said valve assembly including a valve head having an upstream end and a downstream end, a stem connected to said valve head, and a washer encircling said stem and abutting against said downstream end of said valve head, said valve head further including a peripheral skirt portion surrounding said washer, and wherein at least one generally radially extending slot is formed at the abutting surfaces of said valve head and said washer; and

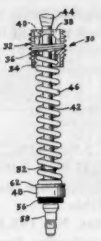
spring means surrounding a portion of said valve assembly for acting in opposition to the direction of flow of gas through said bore, said spring means acting to urge said valve assembly away from said valve seat;

whereby the radially outer end of said at least one slot it shrouded by said peripheral skirt portion of said valve head, the arrangement being such that during normal flow of gas through the device said spring means prevents said valve head and said washer from contacting said valve seat so that the flow of gas is unimpeded, and during an excessive flow of gas said valve assembly is displaced against the force of said spring means causing said washer to abut against said valve seat, and wherein a predeterminedly small quantity of gas is allowed to flow through the device by way of said at least one slot formed at the abutting surfaces of said valve head and said washer, said at least one slot tending to remain free of dust and other inclusions in the gas during normal flow by the fact that the gas is not caused to flow through said at least one slot during normal flow since said at least one slot is shrouded by said peripheral skirt portion of said valve head.

3,918,482
RELIEF VALVE CORE

William Sylvester Stroh, Dickson, Tenn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Mar. 7, 1974, Ser. No. 448,881
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—542 4 Claims



1. In a pressure vessel having a tubular valve housing mounted in an opening therein, the housing having an interiorly threaded upper portion and an upwardly-facing valve seat therebelow; and a relief valve core in the housing comprising:

a. an exteriorly threaded cylindrical body engaging the interior threads of the housing, the body having an axial recess extending up from the lower end thereof and a bridge extending transversely across the upper end thereof, the bridge having a bore on the axis of the body;

b. a downwardly-facing plunger cup of lesser diameter than the body and disposed at the lower end of the core and having a flat radial wall and a connected downward sidewall;

c. a sealing washer disposed in the cup and adapted to seat on the upwardly-facing valve seat to close the valve;

d. pin means having an upper end extending through the bore in the bridge and being free for rotation with respect thereto and having the cup and washer mounted on the lower end thereof; and

e. a spiral compression spring surrounding the pin and engaging the body with its upper end and with its lower end urging the cup and sealing washer away from the body toward engagement with the valve seat;

the improvement comprising a flat antifriction swivel washer disposed about the pin and engaged by the lower end of the compression spring and the upper surface of the radial wall of the cup, the washer having a plating of cadmium and extremely smooth radial surfaces, whereby when the body is screwed into the housing, the antifriction swivel washer permits the rotation of the body without rotation of the sealing washer.

3,918,483
FILTER CAP FOR DRAIN VALVES

Roger A. Van Leeuwen, 7039 E. 40th, Tulsa, Okla. 74145

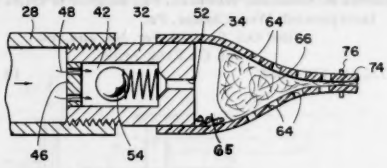
Continuation-in-part of Ser. No. 333,967, Feb. 20, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,501
Int. Cl.[2] E03B *3/18*, *7/07*; E02B *13/00*
U.S. Cl. 137—550 4 Claims

1. In an underground irrigation piping system having one or a plurality of check drain valves, each with an outlet in the end wall of a valve housing, said valves being at separated parts of the piping system, the improvement comprising:

a. a cup shaped rigid enclosure adapted at a first end to be telescopically and removably retained by a slip fit over said housing having said outlet to said drain valve, said enclosure having a plurality of openings at a second end; and

b. a pad of porous and resilient filter material inert to underground soil and fluids and retained inside and substantially filling the internal crosssection of said enclosure

opposite said openings of said second end of said enclosure leaving a sediment collecting space defined by the



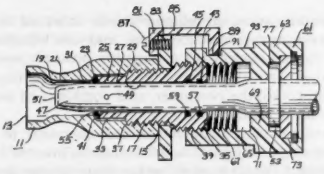
internal walls of said enclosure between said drain valve outlet and said filter material.

3,918,484

FLUID SAMPLING DEVICE

Thomas H. Lamb, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 29, 1974, Ser. No. 437,554
Int. Cl.² F16K *37/00, 31/50*
U.S. Cl. 137—553 **13 Claims**



1. A fluid sampling valve comprising:

a. an adapter having a first bore therethrough;

b. a bushing having a second bore therethrough connected to said adapter, said first and second bores forming a concentric continuous passageway;

c. a closed end tubular sampling stem extending within said continuous passageway spaced from said adapter and said bushing for free movement between an open and closed position, said sampling stem having a fluid inlet port adjacent said closed end;

d. first seal means in contact with said adapter, said bushing and said sampling stem in the open and closed position for sealing said continuous passageway;

e. support means for supporting said sampling stem concentrically within said continuous passageway; and

f. drive means connected to said sampling stem for sliding said sampling stem back and forth within said continuous passageway to position said inlet port on one side of said first seal means in the open position and on an opposite side of said first seal means in the closed position.

8. The invention of claim **7** additionally comprising indicator means for indicating when said valve is in the open and closed position.

3,918,485

MULTIPORT SUBSEA CONNECTOR

Ronald A. Weber, Ojai; Zane L. Griffin, Port Hueneme, both of Calif., and Thomas W. Childers, Mandeville, La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Sept. 18, 1973, Ser. No. 398,362
Int. Cl.² F16L *35/00;* **F17D** *1/00*
U.S. Cl. 137—594 **24 Claims**

1. A connector for use in connecting a multiplicity of hydraulic subsea flowlines comprising:

a first carrier conduit;

a plurality of first flowlines arranged in said first conduit;

a first flange connected to the end of said first conduit and having a plurality of spaced apart holes therethrough;

one half of a coupling arranged in each of said holes in the first flange, said one half comprising:

a first sleeve member having one end extending to about the face of said first flange and having the other end connected to one of said first flowlines and having a first valve means arranged therein;

said first valve means being normally biased closed to prevent flow of fluids through said first valve means and said first flowline;

an annular groove formed on the outer surface of said first sleeve member;

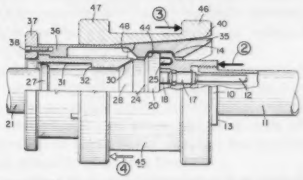
said one end of said first sleeve member forming a tapered shouldered seating surface;

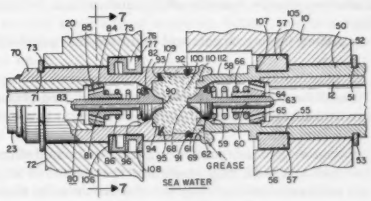
a second carrier conduit;

a plurality of second flowlines arranged in said second conduit;

a second flange connected to the end of said second conduit and having a plurality of spaced apart holes therethrough; the other half of said coupling being arranged in each of said holes in said second flange, said other half of said coupling comprising:

a second sleeve member having one end extending beyond the face of said second flange and having the other end thereof connected to one of said second flowlines and having a second valve means therein;





said second valve means being normally biased closed to prevent flow of fluids through said second valve means and said second flowline connected thereto;

each coupling having:

an "O"-ring seal arranged on the inner wall of said second sleeve member;

a seal ring arranged in said second sleeve member;

said one end of said first sleeve member being insertable into said one end of said second sleeve member and said second sleeve member initially containing grease between the end thereof and said second valve means;

said outer wall of said end of said first sleeve member engaging said "O"-ring in said second sleeve member during initial entry of said first sleeve member into said second sleeve member to trap grease in said second sleeve member and force said grease upon continued movement of said first sleeve member into said second sleeve member through one or both of said valve means into one or both of said flowlines;

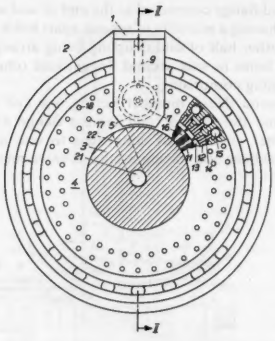
said tapered seating shoulder on said first sleeve member engaging said seal ring on said second sleeve member to seal off the interiors of said flowlines from exterior thereof when said coupling is fully made up;

said first and second valve means opening when said coupling is fully sealed to permit flow of fluids through said first and second flowlines.

3,918,486
DEVICE FOR TRANSMITTING A PRESSURE FLUID FROM A STATIONARY SOURCE TO A ROTATING SHAFT

Ivan Jaroslav Cyphelly, Forchstrasse 968, 8128 Hinteregg, Switzerland

Filed Mar. 11, 1974, Ser. No. 449,959
Claims priority, application Switzerland, Mar. 14, 1973, 3712/73; Aug. 24, 1973, 12216/73
Int. Cl.[2] F16L 27/00
U.S. Cl. 137—580 16 Claims

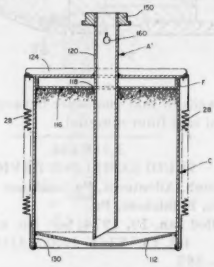


1. A device for transmitting a fluid under pressure from a stationary source to a movable member, said device comprising:
   a. a shaft having an axis and mounted for rotation about said axis;
   b. an annular sealing member fixedly mounted on said shaft and having an engagement face extending about said axis in a circular loop;
   c. a support;
   d. retaining means preventing rotation of said support about said axis with said shaft and movement of said support relative to said sealing member in an axial direction;
   e. a shoe member secured on said support,
      1. said shoe member having a first face formed with a recess and directed toward said engagement face and a second face spaced from said first face and directed away from said engagement face;
   f. biasing means biasing said shoe member to move on said support toward a position of sealing, sliding engagement of said first face with said engagement face during rotation of said shaft,
      1. said biasing means including a source of said pressure fluid, and
      2. a conduit connecting said source to said second face for applying the pressure of said fluid to said second face;
   g. supply means for supplying said fluid from said source to said recess under the pressure thereof,
      1. said recess in said position of sealing engagement being covered by said engagement face,
      2. said shaft and said sealing member being formed with a manifold conduit system including a plurality of communicating branch conduits having respective cirumferentially spaced orifices in said engagement face, said recess sequentially communicating with said orifices during rotation of said shaft; and
   h. a check valve in each of said branch conduits and responsive to said pressure for opening the associated branch conduit when an orifice of said associated branch conduit communicates with said recess.

3,918,487
COMBINED ADAPTOR AND CONTAINER FOR EMPTYING AND REFILLING CONTAINER

Harold R. Smithson, Westtown, Pa., assignor to Oxy-Catalyst, Incorporated, West Chester, Pa.

Filed Oct. 9, 1973, Ser. No. 404,304
Int. Cl. F16k 24/00
U.S. Cl. 137—588 18 Claims



1. In combination, an adaptor device attached to a container having a top and a bottom, said combination being adapted for connection to a negative pressure system for withdrawing particulate matter from, and for injecting particulate matter into, the container, said combination including:
   a. rigid tubular means;
   b. means providing an opening in said container, to provide an air space when said tubular means is inserted into said container; wherein said means forming an opening is larger than said rigid tubular means and wherein said rigid tubular means projects through said opening with said air space intervening therebetween;
   c. a cross member connected to said tubular means at an intermediate point along the length thereof, said cross member extending laterally in both directions therefrom such that, when said cross member is placed astride the top of said container, a first portion of said tubular means projects outwardly away from said container and a second portion projects and extends inwardly into said container; and
   d. means attached to said cross member for releasably retaining said cross member astride said container, whereby said air space functions as an air vent in the container for free air flow when materials are being inserted into or taken from said container.

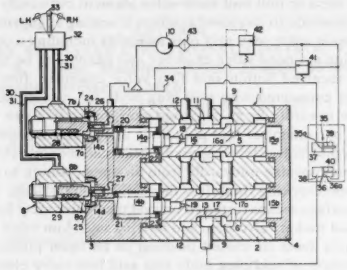
3,918,488
CONTROL VALVES FOR STEERING CLUTCHES AND BRAKES

Teruo Minami, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

Continuation of Ser. No. 158,493, June 30, 1971, abandoned.
This application Nov. 6, 1973, Ser. No. 413,388
Int. Cl.[2] F16K 11/04; F16D 67/04
U.S. Cl. 137—596.16 3 Claims

1. A controlling device for a hydraulic system for steering, comprising a valve body, first and second parallel valve spools slidably arranged within said body, first and second pilot valves affixed to said valve body, at least one feeding port, one outlet port and one drain port for each spool formed in the valve body and communicating with each of the first and second spools, first pressure chambers located respectively at the ends of the first spool and second pressure chambers located respectively at the ends of the second spool, an oil feeding restricted orifice and a feeding chamber within each spool connected between the first pressure chambers and between the second pressure chambers, said feeding chambers connected to said feeding ports by a feeding hole in each spool, springs contained in the pressure chambers on at least

one end of each spool for continuously urging said spool toward its opposing pressure chamber, each of said chambers containing said spring being selectively connected to exhaust



by one of said pilot valves whereby when one said pilot valve is opened, the pressure in the opposing pressure chamber moves the spool and compresses the spring.

3,918,489

VALVE BLOCK

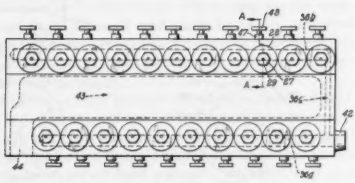
Thomas Vincent Foster, and Frank Alan Fenton, both of Doncaster, England, assignors to Emhart (U.K.) Limited, Doncaster, England

Continuation of Ser. No. 369,693, June 13, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,784

Claims priority, application United Kingdom, June 23, 1972, 29561/72

Int. Cl.² F15B *13/08*

U.S. Cl. 137—596.16 **9 Claims**



1. A valve block for an I. S. glassware forming machine comprising a plurality of valve combinations arranged in two rows, each valve combination comprising a pilot-operated poppet valve having a supply port, an outlet port and an exhaust port and a solenoid-operated pilot valve for directing pilot air to the poppet valve, a pilot line in the valve block common to the pilot valves on all the valve combinations, a first plenum chamber located adjacent all the valve combinations and in fluid communication with the exhaust ports of all said poppet valves, said first plenum chamber being sufficiently large relative to each exhaust port such that the opening of one of said exhaust ports of one of said poppet valves to admit exhaust air to said first plenum chamber does not result in a large fluctuation in the pressure of the air in the exhaust chamber, and a pair of supply plenum chambers each mounted adjacent a respective one of the rows of valve combinations and separated from said first plenum chamber by the associated row of valve combinations, each supply chamber being in fluid communication with the supply ports of the poppet valves of the valve combinations in its associated row.

3,918,490

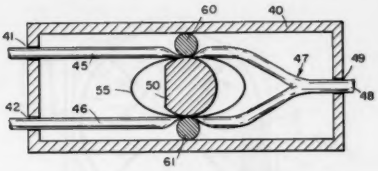
FLUID SWITCHING APPARATUS

George Goda, 390 First Ave., New York, N.Y. 10010

Filed Dec. 20, 1973, Ser. No. 426,829

Int. Cl.² F16K *7/06*

U.S. Cl. 137—597 **5 Claims**



1. A fluid switching apparatus for receiving fluids from a first plurality of source lines and a second plurality of source lines and for switchably routing the fluids from one of the pluralities of source lines to a plurality of output lines, comprising:

a housing

a first plurality of flexible tubes having inlet and outlet ends, said tubes being mounted in said housing in substantially parallel relationship, said inlet ends being adapted for coupling to said first plurality of source lines;

a second plurality of flexible tubes having inlet and outlet ends, said second plurality of tubes being mounted in said housing in substantially parallel relationship and spaced from said first plurality of tubes, the inlet ends of said second plurality of tubes being adapted for coupling to said second plurality of source lines;

means for coupling the outlet ends of the first plurality of tubes to the outlet ends of the second plurality of tubes so as to form a plurality of common outlets, said common outlets being adapted for coupling to said plurality of output lines;

an elongated cam rotatably mounted in said housing between said first plurality of tubes and said second plurality of tubes and transverse the direction of flow of all of said tubes;

first and second elongated members, said first member disposed between said first plurality of flexible tubes and a surface of said housing and said second member disposed between said second plurality of flexible tubes and an opposite surface of said housing, said members being oriented parallel to said cam; and

an elongated flexible sleeve surrounding said cam and forming a friction tube as between said cam and said first and second pluralities of flexible tubes;

said cam being proportioned to normally compress all of said first and second plurality tubes and rotatable to positions whereby either of said first or said second plurality of tubes is released from compression to allow flow therein.

3,918,491

NOZZLE FOR FLUID INJECTION

Wilton W. Weltmer, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

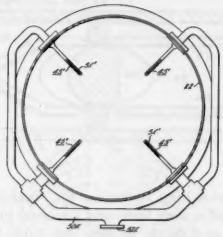
Division of Ser. No. 212,300, Dec. 27, 1971, Pat. No. 3,836,126. This application Mar. 4, 1974, Ser. No. 447,844

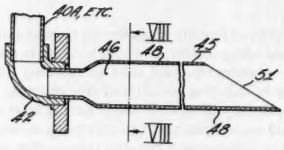
Int. Cl.² F16K *19/00*

U.S. Cl. 137—604 **1 Claim**

1. An injection nozzle for use in injecting a treating agent or the like into a fluid stream passing through a conduit or the like, said injection nozzle being adapted to be mounted with its longitudinal axis extending in a direction inwardly of the periphery of said conduit or the like and into said stream, said nozzle including a discharge opening which is cut on a bias relative to the longitudinal axis of said nozzle, whereby said discharge opening is elongated in said direction to distribute

the treating agent into said fluid stream along an elongated path extending in said direction, said injection nozzle including a hollow fluid passage for said treating agent or the like, said hollow fluid passage being bounded by and defined by a pair of spaced substantially parallel walls which are flat in the





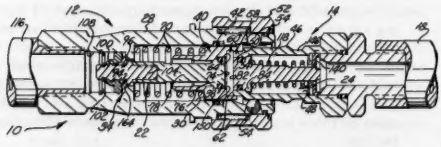
direction of flow of said fluid stream, whereby to reduce resistance to the flow of said fluid stream past said nozzle, corresponding longitudinal edges of said spaced parallel walls being connected to each other by arcuate walls in bounding relation to said hollow fluid passage.

3,918,492

MINIMUM SPILL QUICK DISCONNECT COUPLING

Thomas D. Karcher, Rocky River, and Aly A. Kourah, Brook Park, both of Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Feb. 7, 1974, Ser. No. 440,462
Int. Cl.² F16L *29/00*, *37/28*
U.S. Cl. 137—614.04 **7 Claims**



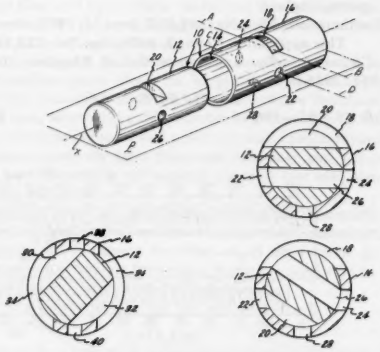
1. A coupling for conducting fluid between a pair of conduits, said coupling comprising a socket assembly adapted to be connected with one of the conduits and a plug assembly adapted to be connected with the other of the conduits, said socket assembly including a socket body defining a first valve chamber, a main valve seat disposed within said first valve chamber, a main valve element disposed within said first valve chamber, said main valve element being movable outwardly from an open position spaced apart from said main valve seat to a closed position disposed in sealing engagement with said main valve seat, said main valve element being effective in said closed position to block fluid flow through said socket body, a socket valve stem connected with and extending outwardly from said main valve element, a valve sleeve disposed within said first valve chamber outwardly of said main valve seat and circumscribing said socket valve stem, said valve sleeve being movable outwardly from an open position to a closed position in which said valve sleeve is disposed in sealing engagement with said socket valve stem, and first spring means disposed within said first valve chamber for moving said valve sleeve outwardly from its open position into abutting engagement with said socket valve stem and for pressing a surface on said valve sleeve against a surface on said socket valve stem to pull said main valve element outwardly from its open position to its closed position in sealing engagement with said main valve seat, said plug assembly including a plug body defining a second valve chamber and adapted to be telescopically received within said first valve chamber, first surface means connected with said plug body for moving said valve sleeve inwardly from its closed position to its open position upon movement of said plug body into said first valve chamber, a plug valve stem disposed within said second valve chamber and movable outwardly from an open position to a closed position blocking fluid flow through said plug body, and second surface means disposed on said plug valve stem for engaging said socket valve stem and moving said main valve element inwardly from its closed position to its open position upon movement of said plug body into said first valve chamber.

3,918,493

VALVE CONSTRUCTION

John D. Tobias, 233 E. Bloomfield, Royal Oak, Mich. 48073

Continuation-in-part of Ser. No. 230,845, March 1, 1972, abandoned. This application Oct. 24, 1972, Ser. No. 300,165
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.23 **17 Claims**



1. In a spool valve structure comprising

a. a sleeve member, perforated to provide a plurality of perforations at least one of which is a sleeve inlet port perforation and at least one of which is a sleeve outlet port perforation for a fluid passing through said structure;

b. a cylindrical core member, rotatably enclosed in said sleeve member and provided with a perforation adapted to register with a sleeve perforation for the passage of a fluid from one such perforation to the other; and

c. wherein, in a first position of said core member relative to said sleeve member at least one of said sleeve perforations and said core perforations have congruent boundaries at the interface thereof and said sleeve perforation extends into said core perforation at the interface of said members on a transverse axis parallel to and offset to one side of a plane containing the longitudinal axes of said members, and that, upon 180° relative rotation of said member, the latter sleeve perforation and core perforation will be disposed on respective parallel axes offset from opposite sides of said plane;

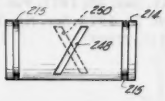
the improvement which comprises, in said first position, one said perforation extending through said sleeve member into said core member to form a peripheral channel and, in an operational position of said valve, said peripheral channel in said core being in register with both a sleeve inlet port perforation and a sleeve outlet port perforation.

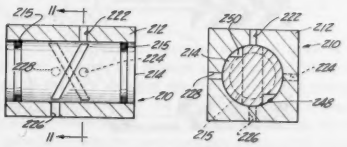
3,918,494

ROTARY ACTUATED DIRECTIONAL CONTROL VALVE

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Dec. 13, 1973, Ser. No. 424,477
Int. Cl.² F16K 5/02, 11/02
U.S. Cl. 137—625.23 **2 Claims**





1. A rotary actuated directional control valve comprising:

a housing having formed therethrough a central through bore and a first set and a second set of fluid passages the axis of each of which set is perpendicular to the axis of said through bore and intersects said through bore and each of which consists of a first and a second bore;

a cylindrical valve spool member rotatably mounted in said through bore and having two annular passages formed in the exterior surface of said spool member on the opposite sides thereof, said annular passages being separated from each other and individually registering axially with said sets of fluid passages and each having a sufficient arc length to connect one of said diametrically opposed bores of said first set of fluid passages to a bore of said second set of fluid passages;

said first bore of said first set of fluid passages and said first bore of said second set of fluid passages intersect said through bore at a first axial position, and said second bore of said first set of fluid passages and said second bore of said second set of fluid passages intersect said through bore at a second axial position,

said annular passages extend at an angle inclined to the axis of said spool member and for a length less than circumferentially around said spool member such that fluid communication is provided between bores at said first axial position and bores at said second axial position and in which a line perpendicular to the axis of said spool member through the center of one said annular passages will intersect the center of said other annular passage.

3,918,495

NOVEL GASKET AND VALVE COMPRISING SAME

Louis Abrahams, Worcester, Mass., assignor to Waters Associates, Milford, Mass.

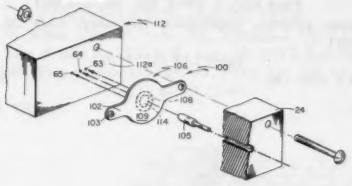
Filed Nov. 14, 1973, Ser. No. 415,784
Int. Cl.² F16K 7/16
U.S. Cl. 137—625.48 **10 Claims**

1. A diaphragm valve which comprises

A. A first housing member comprising inlet and outlet conduits therein and ports communicating therewith a diaphragm operating rod;

B. A second housing member forming means to guide said diaphragm-operating rod;

C. A thin metallic diaphragm adapted to be held snugly in sealing contact with said first housing member and in compression between both said housing members, said diaphragm comprising a flow channel in the face thereof adapted to be held against said first housing member;



D. wherein said operating rod forms means to flex said diaphragm and to position a sealing face of said diaphragm snugly against one said port in said first housing member; and

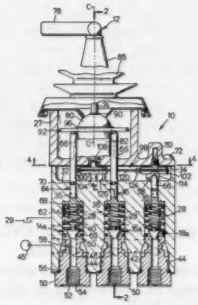
E. wherein substantially all fluid volume between said inlet and outlet conduits of said valve, in its closed position, is formed by said flow channel in said diaphragm.

3,918,496

THREE AXES HYDRAULIC REMOTE CONTROL VALVE

James Otto Byers, Jr., Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Mar. 8, 1974, Ser. No. 449,264
Int. Cl.² F16K 11/18
U.S. Cl. 137—636.1 **8 Claims**



1. A hydraulic control valve for controlling a number of hydraulically operated devices, said valve comprising:

a housing having a number of fluid flow passages in fluid communication with the hydraulic devices,

inlet passage means providing fluid communication between said fluid flow passages and a source of fluid under pressure,

outlet passage means providing fluid communication between said fluid flow passages and a reservoir,

a pressure control valve assembly positioned in each of said fluid flow passages for controlling fluid flow between said inlet passage means and said outlet passage means,

a joy stick mounted on said housing for pivotal movement about three axes, said joy stick including means for controlling one of said pressure control valve assemblies when pivoted about one of said axes and another of said pressure control valve assemblies when pivoted about a second of said axes,

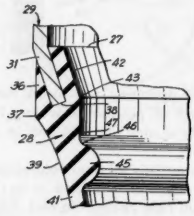
drive means for controlling a third of said pressure control valve assemblies when pivoted about a third of said axes,

and flexible means connecting said joy stick to said drive means.

3,918,497
PRESSURE ACCUMULATOR

Otmar Schön, Scheidterberg, Germany, assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 1, 1974, Ser. No. 466,007
Claims priority, application Germany, May 30, 1973, 2327461
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **5 Claims**

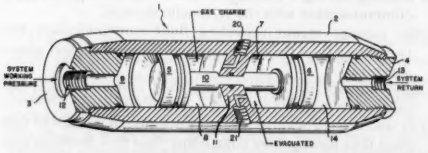


1. A pressure vessel comprising a container of rigid material having one end open and the other end closed, said closed end having an axial port therethrough, a deformable bladder of resilient material in said container, said bladder having a mouth at one end with a thickened rim portion and a reduced thickness wall portion extending from said thickened rim portion and being closed at its other end, an annular metal supporting member having an annular mounting portion of its lower edge embedded in the thickened rim portion and having an annular mounting portion at its upper edge secured to the mouth of said container, means secured to said container mouth to cover the latter, said thickened rim portion of said bladder having an annular bead on its inner surface molded integrally therewith, said annular bead lying in a plane between the lower extremity of said mounting portion and the junction between the end of said reduced thickness wall portion of said bladder and the thickened rim portion thereof.

3,918,498
PRESSURE COMPENSATED HYDRAULIC ACCUMULATOR

William E. Schneider, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,085
Int. Cl.² F16L *55/04*
U.S. Cl. 138—31 **1 Claim**



1. A hydraulic accumulator with shock absorbing ability responsive only to changes in the working pressure of a hydraulic system comprising:

a first chamber containing hydraulic fluid which is at the ambient plus the working pressure of the hydraulic system;

a second chamber filled with a gas charge of fixed amount;

a first movable partition physically separating said first and second chambers;

a third chamber evacuated of substantially all gas pressure;

a fixed partition separating said second and said third chambers;

a fourth chamber containing hydraulic fluid which is at the ambient reference pressure of the hydraulic system;

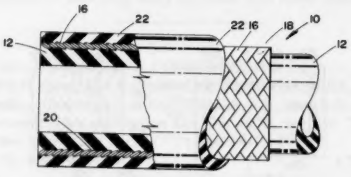
a second movable partition having the same surface area as said first movable partition separating said third and fourth chambers; and

means rigidly connecting said first and second movable partitions to transmit force therebetween.

3,918,499
HOSE

Charles D. Higbee, Arvada, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 109,321, Jan. 25, 1971, Pat. No. 3,755,032. This application Feb. 23, 1973, Ser. No. 335,182
Int. Cl.² F16L *11/08*
U.S. Cl. 138—125 **1 Claim**



1. A flexible hose comprising:

an initially heat curable rubber tube;

one braided ply of essentially zero twist heat shrinkable, initially greige polyester yarn strands comprised of fibers disposed over and substantially covering said tube to define an essentially flat reinforcement;

a cement interstitially disposed between the tube and reinforcement, strands of the braid, and fibers comprising the yarn, the cement and yarn together defining a chemically treated yarn; and

a cover disposed over the reinforcement, the tube, yarn, cement and cover heated to define the cured flexible hose;

whereby application of heat cures the rubber tube and shrinks and further compact the chemically treated yarn to cover near 100 percent of and mechanically interlock with the cured rubber tube.

3,918,500
HARNESS CORD SELECTING AND DRIVING DEVICE FOR JACQUARD MACHINES

Masayoshi Katsumata, Tokyo, Japan, assignor to Kayabakogyo kabushikikaisha, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,334
Int. Cl.² D03C *3/16, 3/20, 17/06*
U.S. Cl. 139—59 **6 Claims**

1. A harness cord selecting and driving device for a Jacquard machine, comprising

a knife box movable in an upright first path;

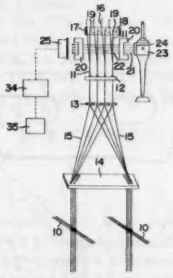
a group of hooks coupled through harness cords to warp yarns in a power loom, said hooks being normally in a position in which they are adapted to be engaged and lifted by said knife box when the same moves in said upright first path;

a group of needles movable in a second path transverse to said upright first path from a first location to a second location and adapted during such movement to push said hooks out of said position;

biasing means permanently biasing said needles towards said first location;

retractable cylinder means for moving all needles of said group in unison in said second path from said first to said second location during each weaving step of said power loom;

a needle selection mechanism, including a plurality of solenoids equal in number to said needles and each positioned adjacent said second location; and



a control unit adapted to energize selected ones of said solenoids in response to pattern signals of the fabric to be woven, so that the needles associated with the energized solenoids are retained by the same in said second location when said cylinder means is retracted whereas the needles associated with the non-energized solenoids return to said first location under the influence of said biasing means so that their hooks can be engaged and lifted during subsequent movement of said knife box in said upright first path.

3,918,501

FEEDER FOR TAPE WEAVING MACHINE

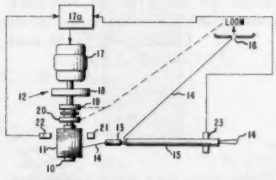
Michael John Wolstencroft, Kingston, Canada, assignor to Du Pont of Canada Ltd., Montreal, Canada

Filed June 18, 1974, Ser. No. 481,373

Claims priority, application United Kingdom, June 21, 1973, 29604/73

Int. Cl.² D03D *47/34*

U.S. Cl. 139—122 H **3 Claims**



1. In an apparatus for feeding flat weft tape from a supply package to a loom that includes a weft tape insertion means on the loom adapted to draw the tape from the package and insert it into the warp shed of the loom, a rotatable chuck for supporting the weft tape supply package; a variable speed motor having a shaft coupled to said chuck for rotation thereof; a weft tape storage device located between the supply package and the weft tape insertion means; an aspirator for drawing the weft tape tangentially from the package and feeding the weft tape into the weft tape storage device the improvement comprising: means for sensing the diameter of the weft tape supply package and providing a signal according thereto; control means coupled to said variable speed motor and actuated by said signal for increasing or decreasing the speed of the motor according to the magnitude of said signal; a clutch means connected between said rotatable chuck and said motor and coupled to said loom for connecting said chuck with said motor only during operation of the loom; and a flywheel on said motor shaft between said motor and said clutch for increasing the moment of inertia of the motor and reducing speed fluctuations.

3,918,502

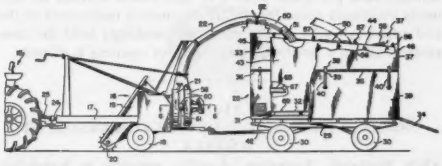
CONTAINER FOR ANIMAL FEED

Joseph M. Kline, 3501 N. Valley St., Arlington, Va. 22207

Division of Ser. No. 283,998, Aug. 28, 1972, Pat. No. 3,818,955. This application Feb. 11, 1974, Ser. No. 441,708

Int. Cl.² B65D *89/08*

U.S. Cl. 150—1 **3 Claims**



3. A portable container for use with an apparatus for harvesting and storing forage for subsequent use as animal feed and having a forage thrower with a discharge chute and a discharge end, said container comprising wall structure of flexible fluid-impermeable thermoplastic material, an inlet sleeve connected to the top of said wall structure and providing ingress into said container, said inlet sleeve receiving the discharge end of the forage thrower chute so that the forage from the thrower is discharged directly into said container, a first opening in the top of said wall structure in spaced relationship to said inlet sleeve, a first one-way valve normally closing said first opening, said first valve being operable by pressure within said container for discharging air from said container through said first opening, a second opening in the wall of said container, a second one-way valve normally closing said second opening, said second valve normally being closed while forage is being introduced into said container but selectively receiving nozzle means which automatically opens the same, and means for closing and sealing said inlet sleeve and said first valve after the container has been filled with forage, whereby said container may be periodically collapsed during filling to evacuate the air and compact the forage and the container is sealed against the ingress of fluid after being filled.

3,918,503

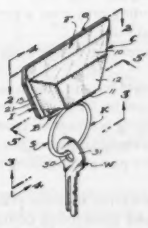
COIN AND KEY CONTAINER

William C. Bundy, 507 S. Douglas St., El Segundo, Calif. 90245

Filed May 2, 1974, Ser. No. 466,190

Int. Cl.² A45C *1/08*

U.S. Cl. 150—35 **9 Claims**



1. In combination, an elongate normally horizontal flexible container having top, bottom and side walls and end walls with longitudinally and laterally upwardly inclined opposite side

portions defining longitudinally outwardly and upwardly inclined inside corners and outside finger engaging end edges occurring on the central longitudinal vertical plane of the container, a central elongate normally closed slot opening extending longitudinally of the top wall on said plane of the container, said end edges adopted to be manually engaged and urged longitudinally inwardly to urge said opposite side portion longitudinally inwardly and outwardly and said side walls and portions of the top wall laterally outwardly and opening said slot opening, ports in the bottom wall at the lower ends of said inside corners and spring means including a spring unit with a key-engaging base at the exterior extending longitudinally of the bottom wall and normally upwardly and longitudinally outwardly inclined legs removably slidably engaged through said ports and seated in said inside corners to normally yieldingly resist longitudinally inward movement of the end edges inwardly and to normally yieldingly hold the container walls in a position where the slot opening is closed.

3,918,504

NONSKID PROTECTIVE DEVICE FOR RESILIENT WHEELS

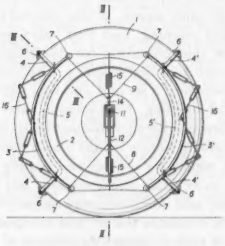
Albin Prokesch, Leonding, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Austria

Filed Sept. 20, 1973, Ser. No. 399,262

Claims priority, application Austria, Sept. 22, 1972, 8161/72; June 20, 1973, 5466/73; June 20, 1973, 5467/73

Int. Cl.² B60C *27/02, 27/10*

U.S. Cl. 152—225 **4 Claims**



1. A nonskid protective device for vehicle wheels having rims and elastic tires, said device comprising;

at least two parts;

each part having on each of its ends a clamp, shaped to surround the tire;

an outer and an inner bar connecting said clamp on the inside and the outside walls, respectively, of said tire;

the bar located on the inside of the tire, when mounted, shaped to run alongside said rim;

the said clamp extending only over a portion of the outside cross section of said tire;

elastic members connecting said two parts to surround said tire;

attaching means on said bars to attach said elastic members to selected points of said bars; the attachment points of said outer bar having a distance from the shaft of said wheel greater than the attachment points of the inner bar; the ends of said two parts comprising at least two pairs of clamps each;

said elastic members having sections extending chordally of the tire between and connecting contiguous ends of said outer bars; and

an elbow lever tensioning lock extending diametrically across the outer side of the tire between and interconnecting the center points of said chordal sections.

3,918,505

WEAR LINK FOR TIRE CHAINS

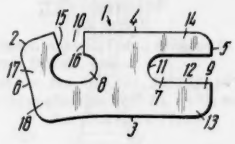
Anton Müller, Unterkochen, Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

Filed Feb. 19, 1974, Ser. No. 443,854

Claims priority, application Germany, Feb. 19, 1973, 2308172; Mar. 1, 1973, 2310173

Int. Cl.² B60C *27/00*

U.S. Cl. 152—243 **17 Claims**



2. A wear link f or a tire chain comprising interconnected chain links, said wear link comprising a web-shaped link body adapted to be disposed in a plane perpendicular to the tire chain when stretched out flat and having one edge surface for engaging the tire and a wear edge surface parallel to and facing away from one edge surface for engaging a roadway and openings extending through said link body perpendicular to the plane of the link body for engaging at least one chain link of the tire chain, and link receiving channel means extending from the margin of said link body into at least one of said openings, said opening being spaced apart substantially the distance as chain links of the tire chain which are in opposed relation to each other, said receiving channel means being more narrow than a said opening.

3,918,506

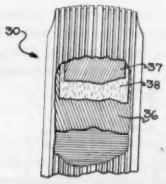
TIRE CONSTRUCTION AND ASSEMBLY TECHNIQUE

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 849,766, Aug. 13, 1969, abandoned. This application Nov. 15, 1971, Ser. No. 199,019

Int. Cl.² B60C *9/18, 9/02*

U.S. Cl. 152—361 R **7 Claims**



1. A tire construction for a wheel comprising:

means connecting said wheel and said tire,

a carcass ply extending toroidally from said wheel, said carcass ply including mutually parallel cords disposed normal to the peripheral centerline, said cords being composed of a plurality of assembled strands, each composed of a multiplicity of continuous glass filaments,

a ground engaging thread carried at the crown of said carcass and

an annular belt construction extending beneath said tread, said belt including a first layer including cords extending at an acute angle to the peripheral centerline of said tread, a second layer including cords extending at an acute angle to the peripheral centerline of said tread, which angle is opposite to the acute angle of the cords of the first layer, and a third layer including cords extending at an angle to the centerline of said tread which is greater than said cord angles of said first and second layers, said

belt ply cords being mutually parallel and composed of a plurality of assembled strands, each composed of a multiplicity of continuous glass filaments, and wherein said third layer is located between said first and second layers.

3,918,507

TIRE AND WHEEL ASSEMBLY

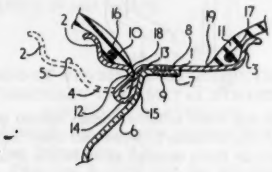
William E. Mitchell, Coventry, England, assignor to Dunlop Limited, London, England

Division of Ser. No. 271,148, July 12, 1972, Pat. No. 3,818,565, which is a continuation-in-part of Ser. No. 123,513, March 18, 1971, Pat. No. 3,708,847. This application Apr. 2, 1974, Ser. No. 457,249

Claims priority, application United Kingdom, Mar. 21, 1970, 13746/70

Int. Cl.² B60C *5/00*

U.S. Cl. 152—379 **3 Claims**



1. A pneumatic tire and wheel assembly comprising a rim having a substantially flat base portion, bead seat portions on opposite sides of the base portion, on which bead seat portions the beads of the tire are respectively located, and rim flanges on the sides of the tire beads and bead seat portions remote from the base portion, the rim having, in its base portions adjacent one of said bead seat portions, a circumferential, radially inwardly extending beading formed by the axial compression of a former well portion, the assembly further comprising a wheel body portion having a radially outer part adjacent one flank of the beading, said body portion being welded to the rim at a position adjacent said flank of the beading.

3,918,508

WHEEL RIM ASSEMBLIES

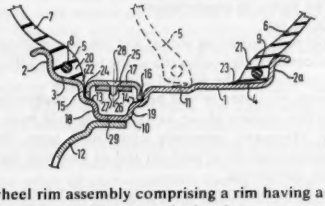
William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, England

Filed Nov. 30, 1973, Ser. No. 420,596

Claims priority, application United Kingdom, Dec. 6, 1972, 56311/72; June 30, 1973, 31288/73

Int. Cl.² B60C *25/12*

U.S. Cl. 152—381 **11 Claims**



1. A wheel rim assembly comprising a rim having a circumferential well disposed between tire bead seats, means to cover the well to define in combination with one of the bead seats a circumferentially extending groove which tapers radially inwardly and is arranged to locate a lip formed on a toe of an associated tire bead when the assembly is in use with a tire mounted thereon to prevent the axial inward displacement of the bead, the diameter of the well covering means being no greater than the minimum diameter of the bead seats so that when the well covering means is in position covering the well the associated tire bead can be moved over said well covering means, wherein the means to cover the well comprises an annular band split at one point about its circumference, the band being provided with radially inwardly turned edges which are arranged to rest on circumferentially extending step portions formed one on each side of the well.

3,918,509

TIRE CHANGING APPARATUS

Robert Michale Trotter, 1969 Fifth St., Chamblee, Ga. 30341

Filed June 26, 1974, Ser. No. 483,158

Int. Cl.² B60C *25/02, 25/06*

U.S. Cl. 157—1.24 **9 Claims**

6. Apparatus for mounting and dismounting tires on wheels comprising a lever including a tire mounting tool at one end and a tire dismounting tool at the other end, a brace removably connectable to the lever adjacent either of the ends of the lever, said brace being pivotably connected to said lever about an axis normal to the length of the lever and arranged to pivot in the same plane as said lever and the distal end of said brace including a covering of high friction material, whereby the distal end of the brace is applied to the rim of the wheel and the tool at the end of the lever adjacent the brace is applied to the tire and moved about the rim of the wheel.

9. Apparatus for mounting and dismounting tires on a spoked wheel including a base, a stanchion extending upwardly from said base, a support ring mounted on said stanchion in a horizontal attitude, and a plurality of hook members positioned about the support ring and extending upwardly from the support ring, each of said hook members including an upright section extending upwardly from said support ring and a horizontal section with the horizontal section of each finger extending approximately in the same tangential direction about the support ring.

3,918,510

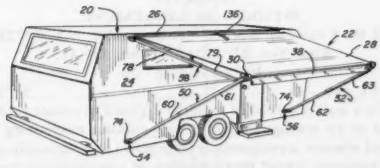
AWNING ASSEMBLIES

Walter W. Hayward, Loveland, Colo., assignor to Fawn Hollow Corporation, Loveland, Colo.

Filed June 28, 1974, Ser. No. 484,100

Int. Cl.² E04F *10/00*; **E06B** *7/00*

U.S. Cl. 160—45 **26 Claims**



1. An awning assembly comprising:

horizontal bar means for securing one edge portion of an awning formed of flexible sheet material;

a cylindrical pipe having means disposed longitudinally thereof for securing an edge portion of said awning opposite said one edge portion;

means defining a pair of sets of cylindrical recesses individually disposed in respective opposite ends of said pipe, the recesses of each of said sets being distributed around the respective end peripheries of said pipe;

a plurality of roller bearings individually disposed in respective different ones of said recesses;

a pair of hubs individually receptive of respective ends of said pipe and each having an inner diameter of a size to journal said bearings;

and a pair of struts individually secured at one end to respective ones of said hubs and individually securable at the other end to respective horizontally-spaced points displaced below said bar means.

3,918,511

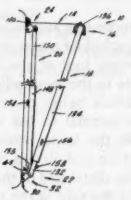
AWNING AND BRACKETS AND EXTRUSION METHOD THEREFOR

Albert E. Upton, Jr., Wichita, Kans., assignor to The Scott & Fetzer Company, Lakewood, Ohio

Division of Ser. No. 344,903, March 26, 1973, Pat. No. 3,866,874. This application Mar. 7, 1974, Ser. No. 448,953

Int. Cl.² E04F *10/06*

U.S. Cl. 160—67 **17 Claims**



1. An awning structure, comprising:

a. an awning sheet securable on one edge to a supporting surface,

b. a roll means secured to said awning sheet along an edge thereof,

c. a roll means support arm having said roll means mounted on the upper end thereof,

d. a first bracket mountable on said supporting surface and pivotally mounting the lower end of said support arm,

e. a second bracket mountable on said supporting surface,

f. a brace member pivotally secured on one end to said second bracket,

g. said brace member having a free end operably securable to the upper end of said support arm when in an extended position, and

h. said first bracket having means to receive and hold in juxtapositional relation both said brace member and said arm member with said free end of said brace member in contact with said first bracket when said awning structure is in a retracted storage position.

3,918,512

WINDOW ARRANGEMENT

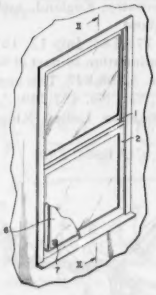
David W. Kuneman, Box No. 55, Dewittville, N.Y. 14728

Filed Nov. 22, 1974, Ser. No. 526,415

Int. Cl.² E06B *7/16*

U.S. Cl. 160—90 **3 Claims**

1. In a wall of a headed building exposed to winter cold and winds an air leakage inhibiting heat-transfer minimizing winterized window arrangement comprising (1) a vertically-slideable two-sash glazed inner window of conventional wooden double-hung type, permanently built into said wall, (2) a seasonal, conveniently removable and replaceable, single sash, glazed outer window element of so-called "storm window" type, (3) a transparent and clear air-tight inter-window bag of flexible plastic positioned in between the doublehung sash and said storm window, and (4) an inflation valve connected to said window bag for inflating of said bag to a low pressure and for subsequently sealing said, said window valve being positioned to permit inflation with said double hung window substantially closed, the shape of said interwindow bag being generally similar to the shape of the interwindow space between said inner and outer windows, but the size of said bag being slightly larger than said interwindow space,



whereby said bag when inflated presses against the top, bottom and side trim surfaces between said inner and outer windows to block air flows through said window arrangement.

3,918,513

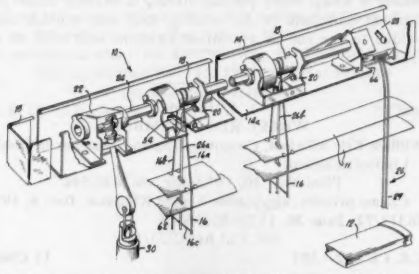
VENETIAN BLIND WITH WORM GEAR TILTING ASSEMBLY

James A. Englund, and Basil H. Buck, both of Middlesex, N.J., assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Apr. 30, 1974, Ser. No. 465,553

Int. Cl.² E06B *9/00*

U.S. Cl. 160—176 **8 Claims**



1. In a venetian blind assembly having slats tiltably supported by tapes, in combination,

a. a head rail;

b. a tilt rod, extending within and longitudinally of said rail and operatively connected to the tapes, for tilting the slats by rotation of the tilt rod about its axis;

c. means, mounted in said head rail, for supporting said tilt rod for rotation about its axis within said head rail;

d. an elongated, generally cylindrical gear, disposed in coaxial relation to said tilt rod at one end thereof, said gear comprising

i. a first shank portion having a socket formed coaxially therein and opening at one end thereof for receiving said one end of said tilt rod and engaging the same such that rotation of the gear effects rotation of the tilt rod, said socket terminating inwardly in a seat within said shank portion, and

ii. a second portion, disposed in side-by-side relation to said shank portion along a common axis therewith, bearing on its outer periphery a plurality of gear teeth, said socket terminating short of the position of said teeth along said common axis;

e. housing means mounted in said head rail for rotatably supporting said shank portion of said gear;
f. a worm journalled in said housing means in meshing relation to said gear teeth for driving said gear; and
g. manually movable means connected to said worm for rotating said worm;

wherein the improvement comprises:

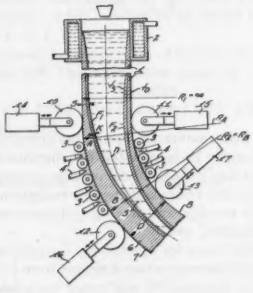
h. said gear further including another shank portion disposed on the side of said second portion opposite to said first portion coaxially therewith;
i. said housing comprising opposed fixed walls having coaxial openings in which said shank portions of said gear are respectively journalled;
j. said second portion including said gear teeth having an external diameter equal to the minimum external diameter of said first portion; and
k. each of said shank portions projecting through the housing wall in which it is journalled and being enlarged externally thereof for preventing axial displacement of said gear relative to said housing.

3,918,514

METHOD OF BENDING OR STRAIGHTENING A CONTINUOUSLY CAST METAL STRAND WITH CONTROLLED COOLING

Rudolf Schöffmann, Linz, Austria, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1974, Ser. No. 430,193
Claims priority, application Austria, Mar. 15, 1973, 2279/73
Int. Cl.² P22D *11/12*
U.S. Cl. 164—89 **5 Claims**



1. A method of preventing internal cracking in a continuously cast metal strand produced in a machine having a primary cooling zone within an open-ended mold, a curved secondary cooling zone, and strand deforming means for changing the radii of a pair of oppositely facing external walls of the solidifying strand; comprising the steps of:

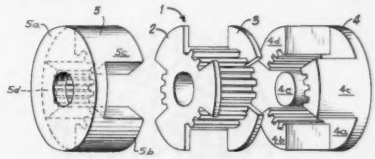
a. deforming the strand to change the strand radii at a location where the strand has a still liquid core defining interface surfaces between the liquid core and surrounding solidified metal, thereby elongating and placing one of said oppositely facing external walls in tension and placing the other of said oppositely facing external walls in compression and with a neutral axis between said wall in tension and said wall in compression;
b. preconditioning the strand prior to deforming by applying an external compression force to the wall in tension to shift the neutral axis toward the elongated wall; and
c. applying controlled secondary cooling to said oppositely facing walls to establish the temperature of said wall in compression at a level of 40° to 400°F higher than the temperature of said wall in tension and to relatively weaken the wall in compression and strengthen the wall in tension, and continue the progressive shifting of the neutral axis toward the elongated wall which began with the application of compression force according to step (b), and thereby reduce elongation of the adjacent internal interface surface and reduce crack formation along said adjacent internal interface surface.

3,918,515

METHOD OF MAKING A DOUBLE FLANGED TIMING BELT PULLEY

Toshio Shiina, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 209,650, Dec. 20, 1971, Pat. No. 3,807,247. This application June 6, 1973, Ser. No. 367,443
Claims priority, application Japan, Dec. 28, 1970, 45-119414. The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.
Int. Cl.² B22D *33/04*
U.S. Cl. 164—137 **3 Claims**



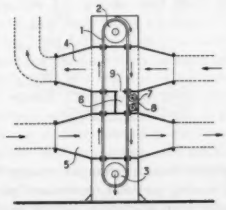
1. A method of making a timing belt pulley having a hub portion with cogs thereon and side flanges integral with the hub portion, comprising the steps of assembling male and female dies with connecting cavities therebetween forming a cogged hub portion and side flanges with notches therein, the notches in each side flange being positioned opposite from non-notched portions of the opposite side flange, and in which each notch in each side flange extends circumferentially a distance at least as great as the circumferential extent of the non-notched portion of the opposite side flange, and filling the cavities with a casting material to form an integral timing belt pulley.

3,918,516

GAS HEAT EXCHANGER UNIT

Jean Carrasse, Antony; Jacques Gerard, Saint-Ouen; Pierre Pounhet, Colombes, and Thérèse Martin, Paris, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), France

Filed Nov. 2, 1972, Ser. No. 303,080
Claims priority, application France, Nov. 2, 1971, 71.39313
Int. Cl. F28d *19/00*
U.S. Cl. 165—5 **11 Claims**



1. A gas heat exchanger unit comprising, a hot gas compartment and a cold gas compartment, at least one heat exchanger unit in the form of a closed loop metal band mounted for

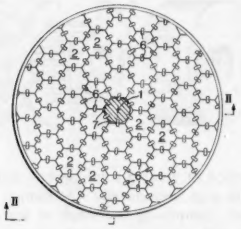
movement through both of said hot and cold gas compartments along first and second paths transverse to the gas flow therethrough, said metal band being formed by a plurality of independent elementary sieves interconnected to form the band and constituted by a plurality of layers of metal lattices, and intermediate compartment disposed between said hot and cold gas compartments traversed by said metal band, cleaning means disposed in said intermediate compartment for removing dust from the band passing therethrough, and means for driving said band along a closed loop path, wherein said cleaning means includes means for intermittently directing jets of gas at high speed onto the band against the opposite surface from the dust deposit.

3,918,517

REGENERATIVE HEAT EXCHANGER MATRIX

Calvin Eric Silverstone, Alcester, and David Stanley Noble, Solihull, both of England, assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Sept. 3, 1974, Ser. No. 502,897
Int. Cl. F28d *19/04*
U.S. Cl. 165—10 **9 Claims**



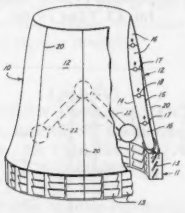
1. A regenerative heat exchanger matrix comprising a multiplicity of blocks of a porous ceramic material having substantially flat side faces arranged side-by-side with adjacent side faces abutting and a plurality of key members by which adjacent blocks are held together, each said key member being inserted into sockets formed in each of the abutting side faces.

3,918,518

ATMOSPHERIC HEAT EXCHANGERS

Opal R. James, Houston, Tex., assignor to Hudson Engineering Corporation, Houston, Tex.

Filed Mar. 15, 1974, Ser. No. 451,537
Int. Cl.² F28F *13/06, 13/00*
U.S. Cl. 165—122 **6 Claims**



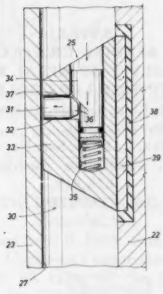
1. An atmospheric heat exchanger, comprising a housing including a base having air inlet means and air outlet means, and a substantially upright conduit which is anchored at its lower end to the base, said lower end of the conduit having air inlet means in fluid communication with the air outlet means of the base and said upper end of said conduit having air outlet means so that air passing through the base is caused to flow upwardly through the conduit, said conduit having inflated cell means thereabout which pneumatically tenses said conduit and maintains its upper end in upright position, and means extending across the housing for introducing a fluid medium to be cooled into the path of air flowing therethrough.

3,918,519

APPARATUS FOR PROTECTING DOWNHOLE INSTRUMENTS FROM TORSIONAL AND LATERAL FORCES

Walter E. Cubberly, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,079
Int. Cl.² E21B *23/04*
U.S. Cl. 166—53 **13 Claims**



1. Well bore instrumentation apparatus comprising:

an elongated outer body adapted for suspension in a well bore and having a longitudinal passage arranged therein; an elongated inner body adapted for reception within said longitudinal passage and having instrumentation means mounted thereon; and

shock-isolating means for operatively restraining said inner body and said instrumentation means from movement by shock forces imposed on said outer body and including clamping means cooperatively arranged on one of said bodies and adapted for lateral movement into frictional engagement with the other of said bodies, and actuating means cooperatively associated with said clamping means and arranged for moving said clamping means into frictional engagement with said other body in response to well bore pressures.

3,918,520

WIRE LINE INFLATABLE PACKER APPARATUS

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

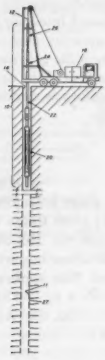
Filed Sept. 30, 1974, Ser. No. 510,265
Int. Cl.² E21B *33/13, 47/00*
U.S. Cl. 166—64 **8 Claims**

8. In a wire line inflatable packer including an inflatable resilient sleeve, gas storage means for inflating said sleeve and means for supporting said sleeve and said gas storage means in an operating position on a wire line in a well, the improvement comprising:

conduit means connected between said gas storage means and said inflatable resilient sleeve;

valve means on said conduit means for controlling flow

through said conduit means to said resilient sleeve; and sequencing timer actuating means for operating said valve



means to sequentially inflate and deflate said sleeve on a predetermined time sequence.

3,918,521

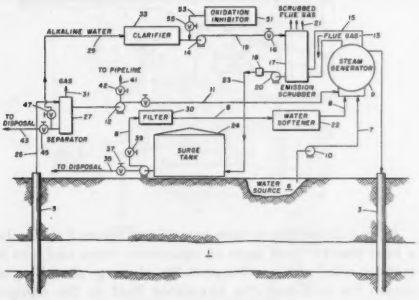
PETROLEUM PRODUCTION BY STEAM INJECTION

Earl S. Snavely, Jr., Arlington, Tex., and Theodore A. Bertness, Whittier, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 326,929, Jan. 26, 1973, Pat. No. 3,844,349. This application June 24, 1974, Ser. No. 482,815

Int. Cl.² E21B *43/24*; **C01B** *17/62*; **C01F** *11/48*

U.S. Cl. 166—272 **4 Claims**



1. A method of producing petroleum from a petroleum-bearing formation penetrated by a well means comprising:

a. generating a hot fluid by injecting feed water into a hot fluid generator and firing said hot fluid generator with a sulfur-containing fuel, said hot fluid generator emitting a flue gas containing sulfur oxides;

b. injecting said hot fluid via said well means into said petroleum-bearing formation;

c. producing petroleum via said well means from said petroleum-bearing formation;

d. passing said flue gas containing sulfur oxides through an emission scrubber vessel;

e. injecting an oxidation inhibitor into an alkaline water containing calcium ions;

f. passing said alkaline water containing calcium ions and said oxidation inhibitor through said emission scrubber vessel in counterflow with said flue gas to scrub said sulfur oxides from said flue gas, to reduce the alkalinity of said alkaline water, to form calcium sulfite and to inhibit the oxidation of said calcium sulfite;

g. maintaining the pH of said water of reduced alkalinity at a pH vallue of at least 6.0;

h. discharging said scrubbed flue gas from said emission scrubber vessel;

i. discharging said water of reduced alkalinity containing said calcium sulfite from said emission scrubber vessel; and

j. separating said calcium sulfite from said water of reduced alkalinity.

3,918,522

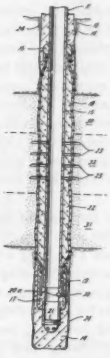
WELL COMPLETION METHOD AND SYSTEM

George O. Suman, Jr., 3701 Kirby Drive, Suite 458, Houston, Tex. 77006

Filed Jan. 28, 1974, Ser. No. 437,231

Int. Cl.² E21B *33/127, 33/14, 43/11*

U.S. Cl. 166—285 **8 Claims**



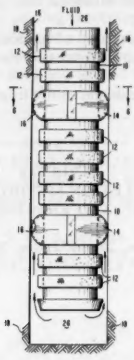
1. A method of completing a well having a formation penetrated by an open borehole comprising positioning a packer in the borehole opposite said formation, said packer having an elongated resilient packing element expansible radially by forcing a fluid into the packer, then flowing a fluid into the packer to cause the packing element to expand radially into contact with the wall of the borehole at said formation while causing the packer to confine said fluid to be within said packing element, said fluid being capable of setting as a solid mass, permitting said fluid to set to a solid mass while so confined by said packer, and then forming at least one perforation extending from the interior of the packer through the confined solid mass and the packing element to the formation.

6. In a well system wherein a formation is penetrated by an open borehole, a packer assembly positioned in the open borehole opposite said formation, said packer assembly having a radially expansible packing element mounted on and having a fluid tight mechanical connection with the exterior of a mandrel, a time setting solid mass between the mandrel and packing element in sufficient quantity that the packing element is radially expanded into engagement with said formation, and at least one continuously open perforation extending from the interior of the packer assembly through the mandrel, the solid mass and the packing element to said formation.

3,918,523
METHOD AND MEANS FOR IMPLANTING CASING

Ivan L. Stuber, 1026 N. Lightner, Wichita, Kans. 67208

Filed July 11, 1974, Ser. No. 487,543
Int. Cl.[2] E21B *33/14*
U.S. Cl. 166—285 22 Claims



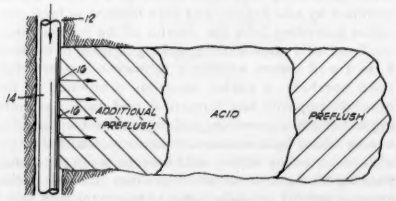
1. A means for implanting intermediate casing, or production casing, or the like, in a drilled hole having drilling fluid which comprises a plurality of bracelet members attached to said casing, each of said bracelet members include a covering and an elastomeric means for expanding, said means for expanding being encased in said covering, and said covering including a protective coating which will dissolve in said drilling fluid after a predetermined time has elapsed to allow said means for expanding to come into contact with said drilling fluid and expand to hold said casing firmly in place in said hole.

17. A process for implanting intermediate casing, or production casing, or the like, in a drilled hole having a drilling fluid which comprises attaching a plurality of bracelet members to said casing as same is being run into said hole, each of said bracelet members including an imperforate covering and an elastomeric means for expanding, said means for expanding being encased in said covering, and dissolving said imperforate covering in said drilling fluid after a predetermined time has elapsed thereby allowing said means for expanding to expand and such expanding against the side of said drilled hole.

3,918,524
FRACTURE ACIDIZING METHOD

Gene C. Broaddus, and Sherman E. Fredrickson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 21, 1974, Ser. No. 499,379
Int. Cl.[2] E21B *43/26*, *43/27*
U.S. Cl. 166—307 16 Claims



1. A method of acid treating an underground well formation containing one or more fractures comprising:

introducing a preflush fluid into said fractures, and thereafter

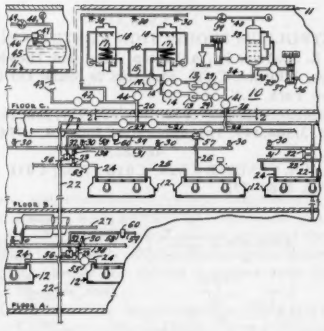
introducing into said fractures an aqueous acid solution having a specific gravity less than the specific gravity of said preflush fluid;

wherein the specific gravity of said aqueous acid solution, when introduced into said fractures, is adjusted such that when said aqueous acid solution is about one-quarter reacted the specific gravities of said aqueous acid solution and said preflush fluid are substantially equal whereby said acid treating is conducted over the entire faces of said fractures.

3,918,525
CIRCULATING SYSTEM

Gershon Meckler, 2750 Ridge Valley, Atlanta, Ga. 30326

Continuation of Ser. No. 305,602, Nov. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 282,193, Aug. 2, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,857
Int. Cl.[2] A62C *35/34*
U.S. Cl. 169—10 1 Claim

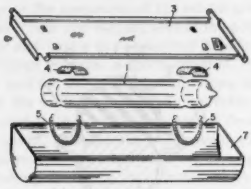


1. In a circulating system comprising means for circulating a heat transfer fluid from an equipment room and into heat-transfer relationship with a plurality of energy absorbing units, means for returning the circulated fluid to the equipment room, means effective to cause heat transfer with the returned fluid to control the temperature thereof, means for delivering the heat transfer fluid from the heat transfer means to the circulating means, means for delivering make-up fluid to the circulating system, and means operatively connecting a plurality of sprinkler heads to the circulating system, a control comprising, in combination, normally open valve means effective in a closed position but ineffective in an open position to prevent the circulation of the heat transfer fluid into heat-transfer relationship with the energy absorbing units, said valve means being ineffective in both positions to prevent flow of the heat-transfer fluid to the sprinkler heads, means effective, in response to a change in a sensed condition, which change indicates a flow of heat transfer fluid from the circulating system, to cause a signal, and means operatively connected to said sensor means and effective, in response to a signal from said sensor means, to close said normally open valve means.

3,918,526
FIRE-EXTINGUISHING DEVICE

Yasuzo Hattori, Urawa, and Jiro Niizuma, Tokyo, both of Japan, assignors to Kabo Kogyo Co. Ltd., Japan

Division of Ser. No. 311,905, Dec. 4, 1972, Pat. No. 3,843,525.
This application July 23, 1973, Ser. No. 382,020
Claims priority, application Japan, Dec. 9, 1971, 46-99043
Int. Cl.[2] A62C 25/00
U.S. Cl. 169—51 7 Claims

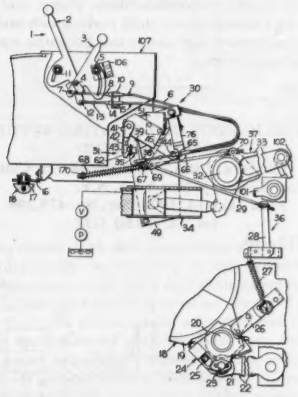


1. A fire-extinguisher for protecting a building, comprising a breakable container having a gas generating composition therein, sealing means for closing said container and making it gas-tight, and holding and fixing means including a spring encircling at least a portion of the periphery of said container for holding it in a fixed position on the building.

3,918,527
CABLE CONTROLLED DRAFT LOAD AND POSITION SENSING LINKAGE

Robert J. Wagner, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 31, 1973, Ser. No. 365,490
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] A01b 63/112
U.S. Cl. 172—9 14 Claims

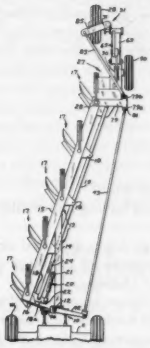


1. A control mechanism on a tractor adapted for operating a hydraulic valve of a hydraulic weight distribution system comprising, valve actuating means, implement hitching means adapted for connection to an implement, manual control means including at least one of an implement position control and a draft load control, at least one of draft load sensing means and implement position sensing means connected to said implement hitching means, at least one pair of flexible elements including a guided element and a guiding element slidably movable relative to each other, means connecting the first of said flexible elements between said manual control means and said valve actuating means for adjustably positioning said valve actuating means, valve compensating means connected to said valve actuating means, means connecting at least one of said draft control sensing means and said position control sensing means through the second of said flexible elements to said valve compensating means to thereby provide a compensating movement to said valve compensating means to modify the movement of said valve actuating means during valve actuation.

3,918,528
PLOW SYSTEM WITH PLURALITY OF PLOW UNITS AND MEANS FOR ADJUSTING SPACING BETWEEN UNITS IN A CONTINUOUS MANNER

Jon E. Kinzenbaw, Ladora, Iowa, assignor to DMI Inc., Goodfield, Ill.

Division of Ser. No. 226,903, Feb. 16, 1972, Pat. No. 3,817,333. This application Jan. 14, 1974, Ser. No. 432,894
Int. Cl.[2] A01B 69/00
U.S. Cl. 172—218 1 Claim



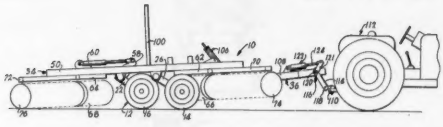
1. In a semi-mounted plow system adapted to be pulled by a traction vehicle and including a main frame having a horizontal beam inclined relative to the direction of travel of said vehicle and semi-mounted to said vehicle for rotation about a vertical hitch axis, a plurality of plow units mounted at spaced locations along said horizontal beam for rotation about respective vertical axes, each unit provided with a ground-working implement, the improvement comprising: power-actuated means for rotating all of said plow units together to adjust the spacing between adjacent plow units to thereby adjust the width of a furrow cut by said units; tail section means including a rear steering wheel and connected to the rear end of said horizontal beam for supporting the distal end of said main frame on the ground; and steering means connected between said vehicle and said steering wheel for steering said tail section means as said vehicle moves; said improvement being characterized in that the spacing of said plow units relative to each other on said horizontal beam, the spacing of the axes of rotation of said plow units relative to said hitch axis, and the location of the foremost plow unit relative to the rear furrow wheel of said vehicle and said hitch axis are such that as said power-actuated means rotates said units to adjust the furrow width cut by adjacent units, said inclined horizontal beam is rotated about the hitch axis such that all of said units travel along predetermines arcs centered at said hitch axis, and the lateral spacing between said foremost unit and said furrow wheel is adjusted to be substantially the same as the adjusted furrow width cut by adjacent ones of the other plow units, said steering means being responsive to the adjustment of said

plow units to rotate the rear end of said horizontal frame in the required direction about said hitch axis.

3,918,529
SECTIONAL IMPLEMENT HAVING SEQUENTIAL LIFTING AND LOWERING

Glenn E. Frager, and Bill J. Penninger, both of Hutchinson, Kans., assignors to Krause Plow Corporation, Inc., Hutchinson, Kans.

Division of Ser. No. 361,985, May 21, 1973, Pat. No. 3,830,313. This application June 14, 1974, Ser. No. 479,407
Int. Cl.² A01B *63/22*
U.S. Cl. 172—294 **4 Claims**

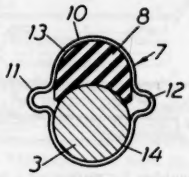


1. In a tillage implement:
a supporting chassis having a normally front and a normally rear end;
a first set of tillage tools mounted on the rear end of the chassis and a second set of tillage tools mounted on the front end of the chassis;
ground engaging means located on the chassis between said first and second tool sets and supporting the chassis for advancement above and along the ground;
a tongue secured to and extending forwardly from said front end of the chassis for coupling the latter with a towing vehicle,
said tongue being jointed, having at least a pair of rigid pieces swingably interconnected for alternately disposing the tongue in a buckled position raising said front end of the chassis and the second set of tools and an unbuckled position lowering said front end of the chassis and the second set of tools,
said ground engaging means being shiftable toward and away from said chassis for movement between a first position raising said rear end of the chassis and the first set of tools and a second position lowering said rear end of the chassis and the first set of tools; and
a fluid-pressure power system for controlling said buckling of the tongue and said shifting of the ground engaging means,
said power system including first power means between said chassis and the ground engaging means controlling said shifting of the latter,
said power system further including second power means between said rigid pieces of the tongue controlling said buckling of the latter,
said first power means normally having greater loading thereon than the loading on said second power means,
said first and second power means being coupled in parallel fluid flow relationship with one another and being of substantially equal fluid capacities for causing actuation of said first power means before the second power means during release of fluid pressure in said system and for causing actuation of the second power means before the first power means during pressure buildup in the system.

3,918,530
ECCENTRIC ELEMENT FOR SILENCING TOOL AND METHOD

Bengt Viktor Nyholm, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 15, 1973, Ser. No. 416,232
Claims priority, application Sweden, Nov. 22, 1972, 15224/72
Int. Cl.² B25D *17/12*
U.S. Cl. 173—1 **17 Claims**

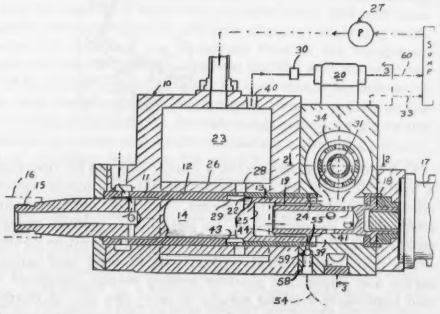


1. A method for silencing a percussion tool by affixing a vibration damping element in contiguous relation thereto, said tool incorporating a shaft portion and a retaining collar adjacent thereto, the method comprising:
passing an undivided substantially cylindrical metallic sleeve over said shaft portion past said collar;
encasing a vibration damping element between said sleeve and said shaft portion in eccentric mass relation to said shaft portion over substantially the whole length of said sleeve and over substantially the whole length of said damping element in the axial direction of said shaft portion; and
thereupon bending said sleeve locally at at least one portion thereof peripherally spaced from the portion of said sleeve opposite to an eccentric mass portion of said vibration damping element and along at least one line extending longitudinally thereof for shrinking said sleeve radially to fixedly circumferentially clamp said vibration damping element to said shaft portion with said vibration damping element disposed in said eccentric mass relation to said shaft portion.

3,918,531
HYDRAULIC ROCK DRILL HAVING AUTOMATIC CARRIAGE FEED

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,208
Int. Cl.² B23Q *5/34*
U.S. Cl. 173—10 **6 Claims**



1. An hydraulic rock drill tool comprising a piston cylinder, a power piston hydraulically reciprocable in the cylinder

having a piston rod with a drill string attached thereto for reciprocation of the drill string and piston as a unit, a source of pressurized hydraulic fluid, the piston having a forward end surface area subject to application of pressurized fluid from the source to move the piston on a return stroke and having an opposite rear end relatively greater surface area subject to application of pressurized fluid from the source to move the piston on a power stroke, first port means constantly exposing the forward end surface area of the piston to pressurized fluid from the source, power driven control valve means operating independently of the operation of the piston for exposing the relatively greater rear end surface area of the piston at the rear of the cylinder alternately to pressurized fluid from the source and to a discharge passage, a guide channel, carriage means mounting the tool for sliding movement along the guide channel relative to the work, hydraulically operable carriage feed means connected to the carriage means for feeding the latter along the channel, and second port means connecting the cylinder at the rear of the latter with the carriage feed means effective following an initial predetermined extent of movement of the piston on a power stroke from a return position to divert some of the pressurized fluid from the rear of the cylinder to operate the carriage feed means concurrently as pressurized fluid at the rear of the cylinder is acting on the rear end surface area of the piston.

3,918,532

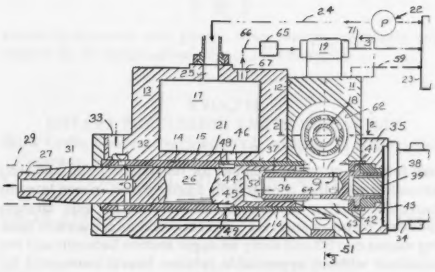
HYDRAULIC TOOL

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed May 10, 1974, Ser. No. 468,899

Int. Cl.² B25D *9/00*; **E21B** *5/00*

U.S. Cl. 173—105 **19 Claims**



1. An hydraulic rock drill comprising a piston cylinder, a piston hydraulically reciprocable in the cylinder having a piston rod portion, a rock bit, a drill string coupling the piston rod portion with the rock bit, a common source of pressurized hydraulic fluid, the piston having a forward end surface area subject to application of pressure fluid from the source to move the piston on a return stroke and having an opposite rear end relatively greater surface area subject to application of pressure fluid from the source to move the piston on a work stroke, port means constantly exposing the forward end surface area of the piston to the pressure of fluid from the source, power driven valve means for alternately exposing the relatively greater rear end surface area of the piston to the pressure of fluid from the source and to a pressure fluid discharge passage, the power driven valve means comprising a valve reciprocable between a position exposing the rear end surface area of the piston to the pressure of fluid from the source and a position exposing the said rear end surface area to the discharge passage, and a motor separate from the operable independently of the piston drivingly connected to reciprocate the valve from one position to the other.

3,918,533

SCREWDRIVER

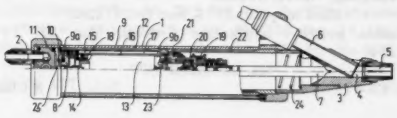
Karl-Heinz Weber, Wolfratshausen, Germany, assignor to Weber Schraubautomaten GmbH & Co., KG, Wolfratshausen-Farchet, Germany

Continuation-in-part of Ser. No. 340,086, March 12, 1973, abandoned. This application July 10, 1974, Ser. No. 487,058

Claims priority, application Germany, July 26, 1972, 2236768; July 18, 1973, 2336599

Int. Cl.² B25B *23/00*

U.S. Cl. 173—155 **6 Claims**



3. A screwdriver comprising a housing, a screwdriver blade rotatably and reciprocably mounted in said housing, a cylinder arranged in said housing, a piston reciprocably and non-rotatably mounted in said cylinder for reciprocating said blade, and an air motor journalled on said piston for selectively rotating said blade, said air motor having a front side adjacent said screwdriver blade and a rear side opposite thereto and being connected to said piston at said opposite side, said air motor having first profile means at its outer circumference, first seal means at the outer circumference of said piston, a ring located at a place in said screwdriver adjacent said front face of said air motor when said piston is in its retracted position, and second profile means provided in said ring and cooperating with said first profile means, for presenting relative rotation between said air motor and said housing.

3,918,534

SPECIAL CLUTCH FOR VIBRATION ISOLATED CHAIN SAWS

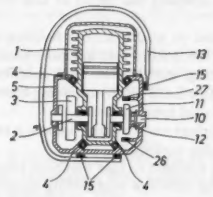
Carl-Magnus Fogelholm, Taysikuu 3 B 25, 02210 Ruomela, Finland

Filed Apr. 25, 1974, Ser. No. 464,248

Claims priority, application Finland, Apr. 26, 1974, 1334/74

Int. Cl.² F16D *43/18*

U.S. Cl. 173—162 **7 Claims**



1. In a portable chain saw, a body, a motor resiliently supported in said body and including a drive shaft, a guide bar secured to said body, an axle supported in said body generally in alignment with said drive shaft and having an end in spaced relationship to an end of said drive shaft but subject to some misalignment, a chain wheel supported for rotation about the axis of said axle, and a centrifugal clutch comprising an inner portion mounted on said drive shaft for rotation thereby and radially expandable with increased speed of rotation, a drum portion rotatably supported from said axle in driving relation to said chain wheel and including a peripheral portion radially spaced from said first clutch portion to be drivingly engaged by said inner portion, and resilient means secured to one of said clutch portions in substantially the same radial plane as said inner portion and said peripheral portion of said drum

portion to provide such resiliency in the connection of said centrifugal clutch portions during driving engagement therebetween as to result in the engagement being substantially continuous despite occurrence of misalignment between said drive shaft and said axle.

3,918,535

DEVICE FOR DAMPING THE RECOIL OF A TOOL CONNECTED TO A HAMMER MACHINE

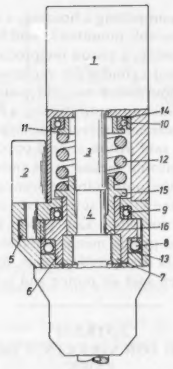
Åke Torsten Eklöf, Skarholmen, and Gunnar Vigg Riss Romell, Djursholm, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 23, 1974, Ser. No. 472,809

Claims priority, application Sweden, May 23, 1973, 7372241

Int. Cl.² E21B *3/00*

U.S. Cl. 173—162 **8 Claims**



1. A recoil damping device for a hammer-type rock-drilling machine which includes a tool, a machine housing coupled to said tool and substantially constantly applying a feeding force to said tool in a working direction, means for additionally supplying impacts to said tool and means for rotating said tool, said tool recoiling after application of said impacts, said recoil damping device damping the recoil of said tool and comprising:

a spring coupled to said machine housing for transferring said feeding force from said machine housing to said tool;

two supporting surfaces in said machine housing and arranged with a fixed relative spacing therebetween in the direction of said feeding force;

two rolling bearings each resting against a respective one of said supporting surfaces;

said tool being coupled to said machine housing so as to act on said spring between said rolling bearings; and

said spring being dimensioned and heavily prestressed between said rolling bearings so that the length of said spring is substantially not influenced by said feeding force applied to said tool.

3,918,536

AUGER SECTION HANDLING APPARATUS

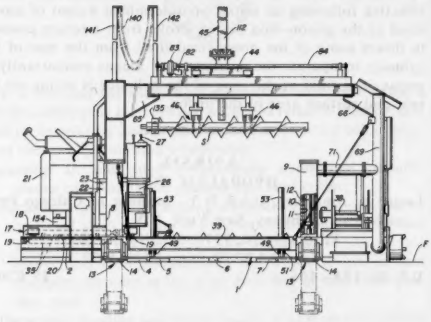
Ronald C. Deeter, Malvern, and John Pozniko, Salem, both of Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Sept. 20, 1973, Ser. No. 398,971

Int. Cl.² E21B *19/14*

U.S. Cl. 175—85 **26 Claims**

1. Auger apparatus comprising a frame; means associated with said frame for rotating at least one auger extending in said apparatus along a lateral axis and made up of a plurality of elongated auger sections connected end-to-end and having axes substantially coinciding with said auger axis; and, associated with said frame, hoist means for lifting and lowering an auger section, comprising a laterally movable member, means for supporting said laterally movable member for lateral movement between a location above a portion of said axis of said auger in said auger apparatus and a location spaced laterally from the said axis of said auger, rigid lift means including auger section holding means, said lift means being carried by



said laterally movable member for movement in an upwardly extending path that is essentially fixed relative to said laterally movable member so that by cooperation of said laterally movable member and said lift means said auger section holding means can lift and carry an auger section between said two locations without appreciable relative lateral movement between said auger section and said upwardly extending path of movement of said lift means on said laterally movable member.

3,918,537

APPARATUS FOR MAINTAINING AN ELECTRIC CONDUCTOR IN A DRILL STRING

Joe K. Heilhecker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

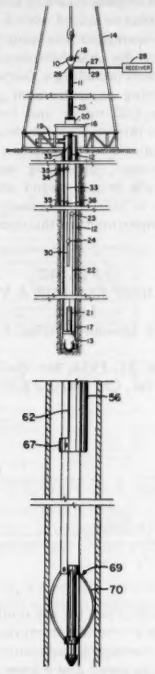
Division of Ser. No. 383,959, July 30, 1973, Pat. No. 3,825,079. This application May 6, 1974, Ser. No. 467,174

Int. Cl.² E21B *17/00, 47/12*

U.S. Cl. 175—320 **7 Claims**

1. In a drilling apparatus having a sectionalized rotary pipe string, a bit connected to said pipe string, means for adding pipe sections to said pipe string, upper and lower guides mounted in said pipe string, an electric conductor mounted in the pipe string and extending upwardly from a terminal below said lower guide to and around said upper guide, downwardly to and around said lower guide, and upwardly to a terminal

substantially at the surface, the improvement which comprises an elongated member interconnecting said upper and lower



guides to prevent said guides from moving angularly with respect to the longitudinal axis of said member.

3,918,538

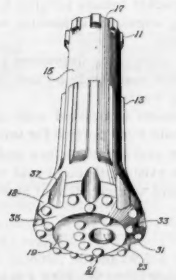
ROTARY PERCUSSION EARTH BORING BIT

Mark Leslie Bender, Pearland, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed July 1, 1974, Ser. No. 484,838

Int. Cl.² E21C *13/01*

U.S. Cl. 175—410 **4 Claims**



1. An improved geometric configuration for a rotary-percussion earth-boring bit that includes a body having torque transmission means on an upper region, an anvil upper surface and an enlarged lower region with a transverse face containing button type inserts, the improvement comprising:

a bevel formed at the corner between the transverse face and the enlarged lower region;

an outer row of circumferentially spaced inserts protruding from said bevel;

an inner row of circumferentially spaced inserts located inwardly wholly on said bevel and between the circumferentially spaced inserts of the outer row;

the inserts of the inner and outer rows having longitudinal axes that are substantially normal to the bevel.

3,918,539

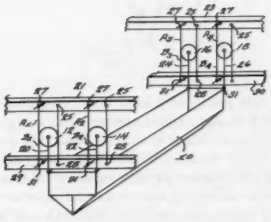
WEIGHING SYSTEM

Cecil S. Wise, Gastonia, N.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Continuation of Ser. No. 295,690, Oct. 6, 1972, abandoned, which is a division of Ser. No. 868,758, Oct. 23, 1969, abandoned. This application June 11, 1974, Ser. No. 478,243

Int. Cl.² G01G *3/14*

U.S. Cl. 177—210 **22 Claims**



1. Weighing apparatus comprising:

a weighing pan,

four groups of loops of wire, each of said loops having an electrical resistance which is proportional to the force stretching said loops,

a first loop of each of said groups being situated so that an increase in the weight in said pan increases the force stretching said first loop, and a second loop of each of said groups being situated so that an increase in the weight in said pan decreases the force stretching said second loop,

an electrical bridge comprising a plurality of elements one of said elements being all of said first loops of all of said groups connected serially and a second of said elements being all of said second loops of all of said groups connected serially,

means to apply an electrical potential across at least one of said groups, and

means to determine the changes of resistance of at least one loop from said four groups of loops, said changes being proportional to changes in weight in said pan.

3,918,540

REMOVABLE SIDE PANEL

Robert C. Haupt, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 29, 1973, Ser. No. 327,674

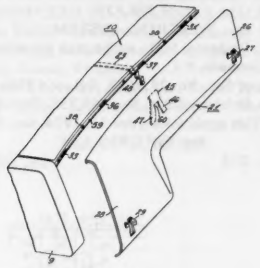
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B62D *25/12*

U.S. Cl. 180—69 R **10 Claims**

1. A removable side panel on an engine hood of a tractor comprising, a vehicle chassis, an engine hood, a front engine hood support means for said engine hood supported on said chassis including, a grill means supporting the forward end of said hood, and a radiator rearwardly of said grill means supporting a portion of said hood and defining an accessory compartment forward of the engine with an access opening on the side of said tractor, a rear engine hood support means defining an engine compartment with the rear portion of said front engine hood support means rearwardly of said radiator

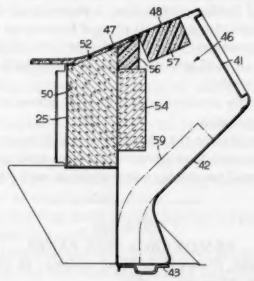
with a second access opening on the side of said tractor, a removable side panel extending substantially the length of the engine compartment and the accessory compartment removably supported on said engine hood, said hood including a mounting portion for mounting said side panel, an upper supported edge portion on said side panel for supporting said side panel on said engine hood, hook and slot means interconnecting said side panel with said hood, alignment means including guiding means on said engine hood and guided means on said panel to facilitate mounting said side panel on said engine hood, latch means removably fastening said side panel on the side of said tractor permitting removal of said panel to thereby provide complete access to said accessory compartment and said engine compartment through said access openings.



3,918,541
VEHICLE CAB WITH DISSIMILAR SOUND ABSORBING MATERIAL

Gregory A. Krieger, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 11, 1974, Ser. No. 441,558
Int. Cl.² B62D *25/10*
U.S. Cl. 180—69 R **10 Claims**

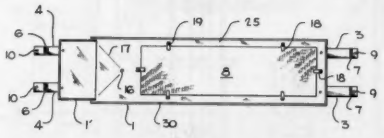


1. A sound absorbing means on a tractor comprising, a platform and a control console defining an operator station, a vehicle chassis, compartment means defining an engine compartment with said compartment means connected to said chassis, resilient means resiliently supporting said platform and control console on said chassis for arresting structural sound transmission from the engine compartment to said operator station, resilient means connecting said compartment means defining said engine compartment to said control console, said control console including a fire wall adjacent said engine compartment, a rearward wall, upper and lower walls, and side walls defining a sound absorbing chamber between said engine compartment and said operator station, blocks of substantial volume of sound absorbing material for absorbing a range of high frequencies and blocks of substantial volume of sound absorbing material for absorbing a range of low frequencies extending into said sound absorbing chamber for absorbing airborne sound over a substantial range of frequencies that is transmitted from said engine compartment into said sound absorbing chamber toward said operator station, said rearward wall including a rearwardly and upwardly inclined portion joining an instrument panel extending upwardly intermediate said upper and lower walls reflecting sound for absorption into said sound absorbing material, said walls reverberating sound for absorption into said sound absorbing material, means supporting said sound absorbing materials on said walls in said sound absorbing chamber of said control console to thereby attenuate sound transmission from the engine compartment to the operator station.

3,918,542
AUXILIARY OIL DRIP PAN FOR A VEHICLE OR THE LIKE

Daniel Murillo, 6631 Greenleaf Drive, Citrus Heights, Calif. 95610

Filed Jan. 21, 1974, Ser. No. 435,101
Int. Cl.² B62D *25/20*
U.S. Cl. 180—69.1 **10 Claims**



1. An auxiliary oil drip pan for use under the preexisting oil drip pan of a vehicle or the like comprising:

a first generally horizontal substantially flat main body portion having an upper and a lower surface;

absorbent means for absorbing oil disposed on a substantial portion of said upper surface:

a second inclined portion adjustably secured to one end of said main body portion and inclined upwardly in a direction leading away from said main body portion; the secured end of said inclined portion being in a partially superposed overlapping relationship with the main body portion;

first mounting bracket means secured to the other end of said main body portion, said first mounting bracket means being angularly adjustable with respect to said main body portion:

second mounting bracket means secured to said inclined portion and being angularly adjustable with respect to said inclined portion,

oil directing means comprising depressed portions on the upper surface of said main body portion for directing oil to an oil removing means,

and oil removing means associated with said upper and lower surfaces of said body portion for selectively removing oil disposed on said upper surface and comprising at least one aperture existing through said main body portion, and plug means sealing off said aperture in a leakproof manner.

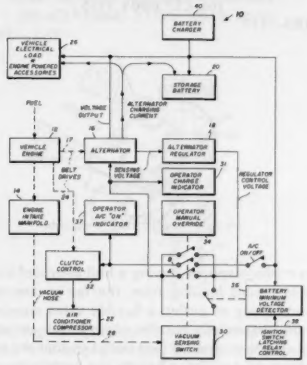
3,918,543
SYSTEM FOR EMPLOYING THE CHANGE OF MOMENTUM DURING VEHICLE DECELERATION FOR ACCESSORY POWER

Norman Halem, 3053 Skyline Drive, Cocoa, Fla. 32922

Filed Dec. 26, 1973, Ser. No. 428,073
Int. Cl.² F02B *67/04*
U.S. Cl. 180—77 R **13 Claims**

1. In a system of the type comprising an internal combustion engine for performing a primary work function and at least

one secondary work function, in which operation of said engine is characterized by alternating periods of primary work function load and no load conditions, said internal combustion engine being of the type including pressure differential means responsive to said load and no load conditions, means for loading said engine with said secondary work function only



during said periods of primary work function no load condition, said loading means comprising:

a flat flexible member having a sealed end and a hollow core communicating with said pressure differential means; and wherein

changes in pressure within said pressure differential means causes flex of said member responsive thereto.

3,918,544
MOTOR VEHICLE STEERING GEAR

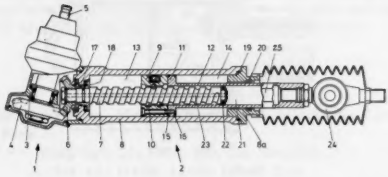
Erich Jablonsky, Bobingen, Rems; Wolfgang Pfundstein, Schwabisch Gmund, and Dieter Elser, Bobingen, Rems, all of Germany, assignors to Zahnradfabrik Friedrichshafen, Friedrichshafen, Germany

Filed Oct. 22, 1974, Ser. No. 517,039

Claims priority, application Germany, Oct. 27, 1973, 2353984

Int. Cl.² B62D *5/10*

U.S. Cl. 180—79.2 R **3 Claims**



1. A steering gear assembly adapted for motor vehicles or the like, comprising a steering shaft (**5**), a screw spindle (**7**) disposed transversely of the steering shaft, intermeshing bevel gears (**4** and **6**) respectively connected to the steering shaft and the screw spindle, a gear casing (**3**) enclosing the bevel gears and rotatably supporting the steering shaft, an elongated housing (**8**) connected to the gear casing and enclosing the screw spindle, means for rotatably supporting the screw spindle within the housing while preventing axial and radial displacement thereof, a steering nut (**9**) drivingly engaged with the screw spindle and axially displaceable within the housing, a piston (**11**) fixedly connected to the nut, a tubular actuator (**12**) connected to the piston and axially displaceable therewith relative to the housing, means (**25**) for preventing angular displacement of the actuator relative to the housing, a fluid chamber (**21**) enclosed within the actuator, means (**22**) mounted on the screw spindle for sealing said fluid chamber in axially spaced relation to the gear casing, and pressure compensating means (**23**) for establishing fluid communication between the chamber and the gear casing through the screw spindle.

3,918,545
MOTOR VEHICLES WITH A RETAINING SYSTEM FOR THE PASSENGERS

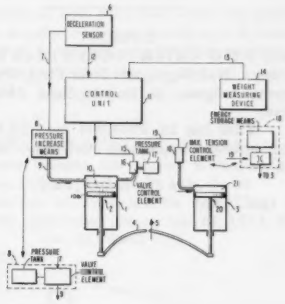
Rudolf Andres, Sindelfingen, and Heinz W. Knoll, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 11, 1973, Ser. No. 405,270

Claims priority, application Germany, Oct. 11, 1972, 2249759

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **30 Claims**



1. In a vehicle retaining system for passengers, said retaining system comprising at least one safety belt means, sensor means for sensing the occurrence of passenger danger and belt-tightening means for automatically tightening said safety belt means to a predetermined pretension on said passengers at a predetermined deceleration threshold sensed by said sensor means, the improvement comprising control means for varying tension of said safety belt means on said passengers upon exceeding said predetermined deceleration threshold as a function of at least one of two control signals respectively representative of vehicle velocity change per time unit and weight of the respectively retained passengers.

3,918,546
HYDROSTATIC ASSIST DRIVE FOR VEHICLES

Willard L. Chichester, and Donald A. Holtkamp, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

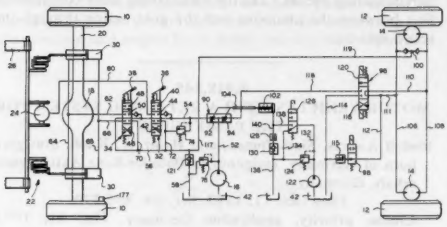
Filed Nov. 21, 1973, Ser. No. 417,994

Int. Cl.² B60K *25/00, 17/34*

U.S. Cl. 180—44 M **9 Claims**

1. Propulsion means for a vehicle having front and rear drive wheel means comprising a main drive train for operating one of said wheel means, and an auxiliary drive train for operating the other of said wheel means, said auxiliary drive train including hydraulic motor means for operating said other wheel means, auxiliary drive pump means adapted to drive said hydraulic motor means, vehicle speed responsive means independent of said pump means and operatively connected to said auxiliary drive train to control the speed of said motor means such that said other wheel means is driven at an effective speed which is substantially equal to the driven effective speed of said one wheel means, and an operator control for selectively disengaging said auxiliary drive train, said independent vehicle speed responsive means including an adjustable

fluid flow divider means operatively intermediate said pump and motor means for controlling the volume of fluid flowing



to said hydraulic motor means to effect said driven effective speed of said other wheel means.

3,918,547

BUS WITH WATER-COOLED REAR ENGINE

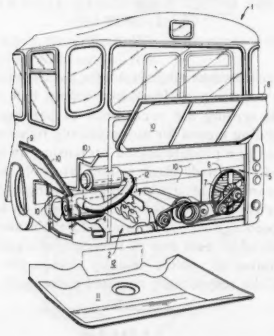
Willi Krämer, Waiblingen, and Peter Fietz, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed July 25, 1973, Ser. No. 382,335

Claims priority, application Germany, May 2, 1973, 2322024

Int. Cl.² B60K *11/04*

U.S. Cl. 180—54 A **5 Claims**



1. In a bus of the type having a water-cooled rear engine and including a radiator means and fan means cooperating with said radiator means, said engine and radiator means being laterally offset with respect to each other in separate first and second chambers, respectively, said respective chambers being encapsulated with a noiseabsorbing material, the improvement comprising said fan means being mounted between said respective chambers substantially at one end of said engine near the rear wall of the engine chamber for drawing air through said radiator means, a single air discharge aperture arranged near the front end of said engine at a front wall of the engine chamber for receiving the air from said fan flowing through the longitudinal extent of the engine chamber and out said air discharge aperture, and a lower cover means for removably enclosing said respective chambers, said lower cover means being removable for servicing said engine and radiator means, and said air discharge aperture being disposed near said front end of said engine above said lower cover means.

3,918,548

GAS CUSHION VEHICLES

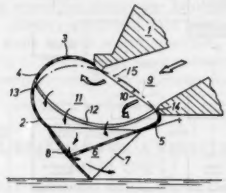
Raymond William Dyke, Southampton, England, assignor to Vosper Thornycroft Limited, Porstmouth, England

Filed Dec. 26, 1973, Ser. No. 427,537

Claims priority, application United Kingdom, May 7, 1973, 21642/73

Int. Cl.² B60V *1/16*

U.S. Cl. 180—117 **4 Claims**



1. A gas cushion vehicle having a hull provided with lift fan means, duct means leading from the fan means to the gas cushion and having an outlet, a flexible valve membrane having a pair of substantially parallel edges which are attached to the hull on opposite sides of said outlet so that the membrane extends across said outlet, whereby the membrane is flexibly movable into an open position clear of said outlet when the lift fan means is operating and is movable into a closed position so as to close said outlet when the lift fan means is not operating and the gas pressure acting within the cushion is higher than the gas pressure acting within the duct means, and a flexible skirt attached to said hull, with one of said edges of the valve membrane attached to said flexible skirt.

3,918,549

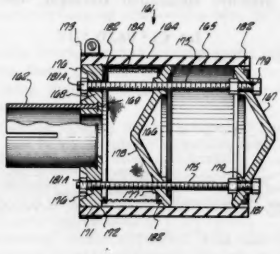
SOUND DAMPING APPARATUS

Milo E. Murphy, Long Beach, Calif., assignor to Murphy Muffler, Inc., Los Angeles, Calif.

Filed Oct. 23, 1973, Ser. No. 408,388

Int. Cl.² F01N *1/08*

U.S. Cl. 181—57 **2 Claims**



1. A sound damper for use with gas streams and comprising a cylindrical sheath of gas impervious material defining a first volume, a transverse disc dividing the volume defined by the sheath to define a second volume, an end wall closing the first volume, gas entry means connecting to a volume, a peripheral edge on each of the transverse disc and the end wall adapted to contact the sheath, threaded means for supporting the transverse disc and the end wall in spaced relationship, said peripheral edge and said sheath separating in response to gas pressure to define intermittent gas exit means, a conical section central of the transverse disc, a conical central section on the end wall, the axis of each conical section coinciding with the axis of the cylindrical sheath, and means for reversing the orientation of the conical sections of the disc and the wall separately, said transverse disc and said end wall being similar so as to interchange position and function.

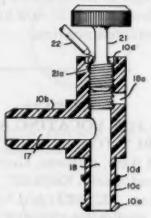
3,918,550
HEARING AID DEVICE

Humbert Milani, San Jose, Calif., assignor to Robert M. Sheeley and Larry M. Sheeley, both of San Jose, Calif.

Continuation-in-part of Ser. No. 275,324, July 26, 1972, Pat. No. 3,800,101. This application Oct. 3, 1973, Ser. No. 403,198. The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.

Int. Cl.² G06C 25/00; H04R 25/00

U.S. Cl. 181—135 1 Claim



1. In a hearing aid apparatus, a venting adapter for connecting the round tube from a hearing aid amplifier to an ear mold, comprising:

a first hollow tubular body member having a hole therethrough, said tubular member having one end adapted for attachment of the sound tube leading from a hearing aid and said tubular member having the hole at the other end threaded;

a second hollow tubular member having one end fixed to said first tubular member and having a hole therethrough communicating with the first tubular member hole and having the other end adapted for attachment to an ear mold such that sound transmitted from the sound tube of the hearing aid will pass through said tubular member holes to the ear mold and on to the ear auditory canal of the hearing aid wearer;

a vent opening in said first tubular member near the other end thereof and leading from the hole therein to the outside of the tubular member at a point external to the ear; and

a threaded screw member threaded into the threaded hole at the other end of the first tubular member such that by turning the threaded screw member it will be caused to overlap and regulate the size of the vent opening for regulation of the volume of sound transmitted through the adapter to the ear auditory canal of the wearer.

3,918,551
SPEAKER SYSTEM

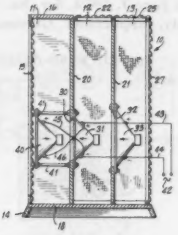
Alfonso Rizo-Patron, Manuel Bonilla 147, Miraflores, Lima 18, Peru

Filed Oct. 21, 1974, Ser. No. 516,186

Int. Cl.² G10K 13/00; H04R 7/16

U.S. Cl. 181—144 10 Claims

1. An omnidirectional speaker system comprising an arrangement of substantially open baffled and unbaffled speakers for the reproduction of the full range of audible frequencies, said speakers being of the type having acoustic radiators which produce both front and rear waves of acoustic energy, mounted coaxially with axial separations therebetween, and wherein the speakers of a first pair are joined to two open baffles having their front surfaces, where the speakers are mounted, perpendicular to their common axis, with said speakers electrically connected to an audio frequencies signal source so as to cause their radiators to move in the same direction, pistonwise, at any given instant; characterized in that at least three speakers are provided to constitute at least two pairs of speakers, the speakers of each pair being spaced at substantially the same distance coaxially from each other in both pairs; in that the second pair of coaxial speakers is formed by mounting the third unbaffled speaker coaxially with the baffled pair, thereby using one of the baffled speakers as



a common member of both pairs; and in that the speakers of the second pair are electrically connected so as to cause their radiators to move in an opposite direction to each other, push-pullwise, at any given instant.

3,918,552
ELEVATOR CONTROL SYSTEM

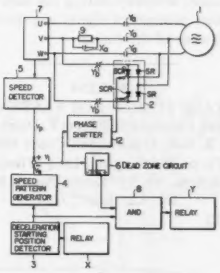
Tadao Kameyama, Ibaraki, and Akinori Watanabe, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 23, 1974, Ser. No. 435,972

Claims priority, application Japan, Jan. 24, 1973, 48-9541

Int. Cl.² B66B 1/32

U.S. Cl. 187—29 R 15 Claims



1. A system for controlling the braking force applied to an elevator car comprising a motor for driving the elevator car, means for detecting the speed of the elevator car, means for detecting the deceleration starting position for the elevator car, circuit breaking means for cutting off said driving motor from the power supply, means for generating a braking pattern signal for applying the braking force to the elevator car in response to the application of the output of said deceleration starting position detecting means, and means for comparing the output of said braking pattern signal generating means with the output of said speed detecting means thereby controlling the braking force applied to the elevator car, wherein means are provided so that the operation of said circuit breaking means and said means applying the braking force to the elevator car can be started with a suitable delay time depending on the load of said motor after the appearance of the output from said deceleration starting position detecting means.

3,918,553

METHOD AND APPARATUS FOR SIGNALING BRAKE LINING WEAR OF A BRAKE

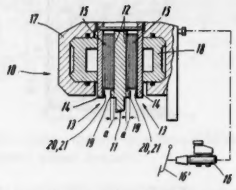
Peter Hattwig, Wolfsburg, Germany, and Günter Munchenberg, Sao Paulo, Brazil, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 7, 1974, Ser. No. 477,186

Claims priority, application Germany, June 8, 1973, 2329245

Int. Cl.² F16D *66/02*

U.S. Cl. 188—1 A **18 Claims**



1. A process for signaling of brake lining wear of a control mechanism equipped brake of a vehicle, particularly of a brake for a motor vehicle, having at least one friction shoe, whereby the brake lining of the friction shoe is mounted on a supporting body and can be brought into frictional contact with a friction area that is part of a rotatable braking body, at least one of the bodies having a raised area which extends part-way in the direction of rotation along the friction area and projects in direction towards the other of the two bodies, the raised area being dimensioned such that it comes in contact with a counter area of the other body only at a prescribed wear of the brake lining, said method comprising periodically changing the contact pressure between the friction shoe and the braking body in response to intermittent contact between the raised area snd the counter area during the braking process, whereby during the said periodic changing of the contact pressure a signal is generated to thereby indicate critical wear of the lining.

3,918,554

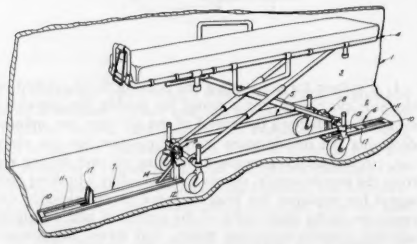
CRASH STABLE COT FASTENER

Elroy E. Bourgraf, Cincinnati; Robert E. Dunn, Bloomingburg, and Kenneth R. Self, Washington Court House, all of Ohio, assignors to Ferno-Washington, Inc., Wilmington, Ohio

Filed Sept. 30, 1974, Ser. No. 510,806

Int. Cl.² B60T *1/14*

U.S. Cl. 188—32 **19 Claims**



1. An ambulance cot fastener adapted to be recessed in the floor of an ambulance comprising an elongated channel-shaped housing having a hollow interior, a locking arm pivotally connected at one end to said housing adjacent one end thereof, said locking arm being pivotally movable from a retracted position in which it is contained within the hollow interior of said housing to an extended position in which it extends upwardly from said housing, an elongated actuating link slidably mounted within the hollow interior of said housing for movement toward and away from said locking arm, and a pivot link interconnecting said locking arm and said actuating link, said pivot link being pivotally connected at one end to said locking arm at a point remote from the pivotal connection of said locking arm to said housing and pivotally connected at its opposite end to said actuating link, whereby movement of said actuating link towards said locking arm causes said pivot link to move said locking arm from its retracted to its extended position, and movement of said actuating link in the opposite direction will cause said pivot link to move said locking arm to its retracted position, said pivot link lying with the hollow interior of said housing when said locking arm is in its retracted position.

3,918,555

APPARATUS FOR LOCATING A FRICTION PAD ASSEMBLY TO A SUPPORT MEMBER

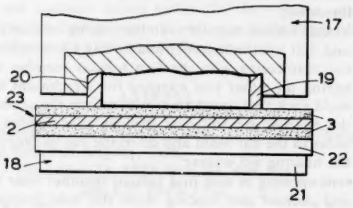
Heinrich Bernhard Rath, Koblenz, Germany, assignor to Girling Limited, Birmingham, England

Filed Jan. 21, 1975, Ser. No. 542,810

Claims priority, application United Kingdom, Jan. 22, 1974, 3003/74; Feb. 13, 1974, 6445/74

Int. Cl.² F16D *65/02*

U.S. Cl. 188—73.5 **17 Claims**



1. Locating means for locating a friction pad assembly in a vehicle disc brake of the type comprising a rotatable disc, a friction pad assembly for engagement with said rotatable disc, and a support for urging said friction pad assembly into engagement with said disc to apply the brake, said locating means comprising a strip of substantially incompressible material adapted to be interposed in its position of use between said friction pad assembly and said support, and layers of adhesive coating both sides of said strip to attach said pad assembly to said support when said strip is disposed in the said position of use.

3,918,556

AUTOMATICALLY ADJUSTING BRAKING DEVICE

Masatugu Nagatomo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

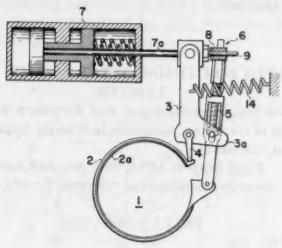
Filed July 2, 1974, Ser. No. 485,201

Int. Cl.² F16D *49/20*

U.S. Cl. 188—77 R **3 Claims**

1. An automatically adjusting braking device for a band brake, comprising a brake drum secured to a vehicle with a band element in engaging contact therearound with one end secured to an anchor means and the other end secured to an adjusting component wherein the anchor means is connected to a piston rod projecting from a hydraulic cylinder, with a

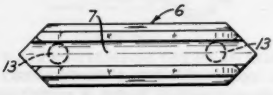
feed mechanism located on the adjusting component and composed of a clutch adapted to be driven by an engaging rod



projecting from said piston rod and wherein a return spring is connected to the anchor means.

3,918,557
TROLLEY ELECTRICAL COLLECTOR

Donald R. Ross, Sr., Pittsburgh, Pa., assignor to U-S Safety Trolley Corporation, Pittsburgh, Pa.

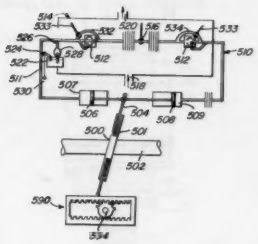
Filed Nov. 7, 1974, Ser. No. 521,684
Int. Cl.[2] B60L *5/06*
U.S. Cl. 191—59.1 **3 Claims**

1. In a trolley electrical collector comprising an elongated metal shoe having a groove in one side extending from end to end of the shoe for receiving a trolley wire, the opposite side of the shoe being provided with longitudinally spaced threaded holes having their inner ends spaced from said groove, and screws in said holes for attaching the shoe to a support; the screws being made of a metal that is at least as soft as the shoe, whereby if the portion of the shoe originally separating said groove from the inner ends of the screws is worn away by a trolley wire, further wear of the shoe will occur in the same direction accompanied by wear of the screws at the same rate.

3,918,558
FRICTIONLESS BRAKE

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Continuation-in-part of Ser. No. 361,633, May 18, 1973. This application Nov. 15, 1973, Ser. No. 416,010
Int. Cl.[2] B60K *41/20*
U.S. Cl. 192—3 R **6 Claims**

2. A brake apparatus comprising a first piston means and second piston means connected to each other and communicating with each other by fluid conduit means, each piston means comprising a piston housing, a piston slidably mounted in said housing and a connecting rod secured to said piston, at least one vortex amplifier placed in said fluid conduit means to control the flow of fluid through said fluid conduit means, a by pass conduit connected to said fluid conduit means with each end of said by pass conduit communicating with said fluid conduit means on the opposite sides of each said vortex amplifier and valve means positioned on said by pass conduit, said valve means being positioned on said by pass conduit and adapted to shut off the flow of fluid through said by pass conduit, a stop valve placed in said fluid conduit means, said stop valve being adapted to selectively prevent the flow of fluid through said fluid conduit means, a ring member interposed between and secured to the connecting rods of said first and second piston means, said ring member being rotatably mounted on a rotatable swash plate which is movably mounted on a drive shaft, said rotatable swash plate being adapted to cause said ring member to reciprocate and drive

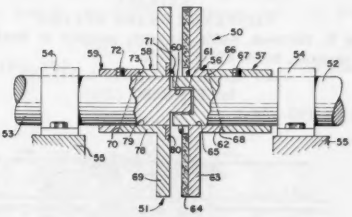


said first and second piston means, said drive shaft being connected to at least one wheel, a second drive means connected to and operated by said ring member, said second drive means being adapted to convert the reciprocating motion of said ring member into rotary motion of a drive storage means.

3,918,559
CAMMING MECHANISM FOR A BRAKE OR CLUTCH DEVICE

Louis Rousset, 115 Avenue B, Brownsville, Tex. 78520

Filed Oct. 17, 1974, Ser. No. 515,547
Int. Cl.[2] F16D *43/20, 65/14;* **B60T** *7/12*
U.S. Cl. 192—54 **10 Claims**



1. A mechanism comprising:

a. an axially extending shaft means carrying a pair of axially displaced members the first of which has a disc thereon;

b. a third member on the shaft and having a disc thereon;

c. spring means interposed between the pair of members and the third member for biaisng the latter away from the pair of members;

d. first cam means on the pair of members responsive to rotation of the second member of the pair for urging the first member toward the third member against the bias of the spring and causing the discs to engage each other;

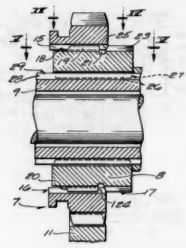
e. a fourth member on the shaft means adjacent the third member and rotatable thereon relative to the latter; and

f. second cam means on the third and fourth members responsive to relative rotation therebetween for urging the third member toward the first member so that the discs are urged into tighter engagement.

3,918,560
GEAR SHIFT SPLINE LOCK

George O. Zach, Jr., Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1974, Ser. No. 523,490
Int. Cl.² F16D 11/04
U.S. Cl. 192—114 T 10 Claims

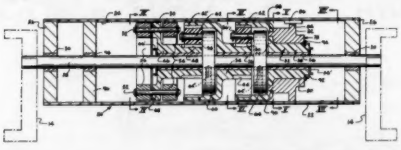


1. A spline lock for a gear shifting mechanism in a power transmission comprising, a rotating torque transmitting gear, gear teeth on the external periphery of said gear defining an axially tapered tooth surface on the side of each of said gear teeth, an internal spline defining internal spline teeth on the internal periphery of said gear, a torque transmitting member rotating on a common axis with said gear, an external spline defining external spline teeth on the external periphery of said torque transmitting member, said external spline including a first set of external spline teeth and a second set of external spline teeth axially aligned and separated by an annular groove, another gear, said tapered surface of the gear teeth on the external periphery of said torque transmitting gear engaging said other gear thereby tending to tilt the internal spline of said torque transmitting gear for engagement of an end of said second set of external spline teeth to thereby lock said splines for retaining engagement between said gears.

3,918,561
CONVEYOR BRAKE ROLLER

Sven E. Isacsson, Saffle, Sweden, assignor to Brake Roller Company, Battle Creek, Mich.

Filed Apr. 2, 1973, Ser. No. 347,192
Int. Cl.² B65G 13/075
U.S. Cl. 193—35 A 2 Claims

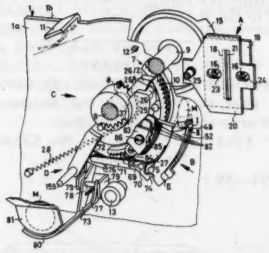


1. A conveyor brake roller comprising, in combination, an elongated cylindrical tube having an axis, opposite ends and an inner cylindrical surface concentric to said axis, a shaft coaxially extending through said tube having ends extending beyond the tube ends adapted to be stationarily fixed, a speed increasing transmission within said tube, said transmission comprising a plurality of interconnected planetary gearing assemblies each including rotatable input and output members coaxially rotatable about said tube axis, said transmission including a first stage assembly and a last stage assembly, the output member of said first stage assembly being connected to and driving the input member of the adjacent assembly, radially movable centrifugally operated friction brake members mounted upon the output member of said last stage asembly frictionally engageable with said inner cylindrical surface, an annular hub concentrically fixedly mounted on said first stage assembly input member, and keying means mounted on the interior of said tube fixed with respect to said tube against relative rotation thereto about said axis and drivingly connected to said hub.

3,918,562
APPARATUS FOR TIMING INTERVALS OF VARYING LENGTH

Ortwin Wokötck, Schwenningen, and Bernhard Kaiser, Villingen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed May 9, 1974, Ser. No. 468,445
Claims priority, application Germany, May 10, 1973, 2323577
Int. Cl.² G07C 1/30
U.S. Cl. 194—78 7 Claims



1. In an apparatus for timing intervals of varying magnitude, particularly in a parking meter, a combination comprising manually operable first means; second means associated with said first means and operative for receiving a coin, and for determining the value of said coin in response to the operation of said first means; third means which is set in response to operation of said first means to one of a plurality of positions in dependence upon the value of the coin, and which moves in response to operation of said first means; fourth means displaceable by said third means through increments whose length depends upon the position to which said third means is set; and time-indicating fifth means operatively associated with said fourth means and being movable to a plurality of different settings in each of which it indicates a time interval of different magnitude, in response to said movement of said fourth means and in dependence upon the length of the respective increment, said fourth means comprising a pivotable segment in motion transmitting relationship to said fifth means, and a plurality of elements cooperating with said third means said segment for controlling the transmission of motion from said segment to said fifth means in dependence upon the setting of said third means.

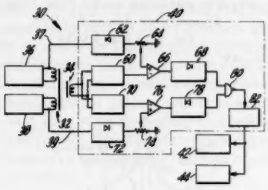
3,918,563
COIN ARRIVAL SENSOR

Guustaaf Arthur Schwippert, Pijnacker, and Wouter Smits, Schiedam, both of Netherlands, assignors to Mars, Inc., McLean, Va.

Filed Nov. 21, 1974, Ser. No. 525,840
Claims priority, application United Kingdom, Nov. 22, 1973, 54319/73
Int. Cl.² G07F 3/02
U.S. Cl. 194—100 A 34 Claims

1. Apparatus for sensing the arrival of a coin in a coin handling mechanism and for producing an output signal when the coin is of an acceptable type of material comprising: transmitting means including at least one transmitting inductor, for generating an oscillating magnetic field having components of two substantially different frequencies; receiving means including at least one receiving inductor disposed in the mag-

netic field produced by said transmitting means for detecting the amplitude of said components at the location of said receiving inductor; means for guiding a coin between the transmitting and receiving inductors so that a substantial portion of the magnetic energy received by said receiving inductor is transmitted through the coin; and means for comparing the



amplitudes of the components detected by the receiving means with the corresponding amplitudes for coins of an acceptable type of material and for producing an output signal indicative of the arrival of a coin of an acceptable type of material when the detected amplitudes of both components correspond substantially to the amplitudes for a coin of an acceptable type of material.

3,918,564

METHOD AND APPARATUS FOR USE IN AN INDUCTIVE SENSOR COIN SELECTOR

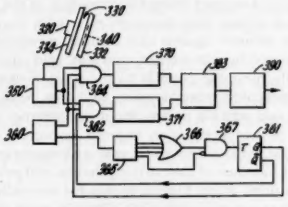
Fred P. Heiman, Delran, N.J., and Gerhard Herzog, Lugano, Switzerland, assignors to Mars, Inc., McLean, Va.

No Drawing. Filed Oct. 12, 1973, Ser. No. 405,926

Claims priority, application United Kingdom, Oct. 12, 1972, 47164/72

Int. Cl.² G07F 3/02

U.S. Cl. 194—100 A **27 Claims**



1. A method for examining coins with respect to authenticity including the steps of

producing an alternating magnetic field,

subjecting a coin to the field,

producing a first signal having a quality representative of the degree of interaction of the coin with the field,

determining a first value of said quality at a time when no coin is in the presence of the field,

determining a second value of said quality at another time when the coin is in the presence of the field,

producing a second signal having a value representative of a function which is dependent upon both the first value and the second value, and

comparing the value representative of the function for the coin with a value representative of the function for an acceptable coin.

3,918,565

METHOD AND APPARATUS FOR COIN SELECTION UTILIZING A PROGRAMMABLE MEMORY

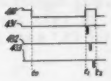
Guy Lloyd Fougere, Arlington, Mass.; Walter John Greene, Sunnyvale, Calif., and Dennis Clifford Jeffreys, Bedford, Mass., assignors to Mars, Inc., McLean, Va.

Filed Oct. 12, 1973, Ser. No. 405,927

Claims priority, application United Kingdom, Oct. 12, 1972, 47161/72; Ireland, Oct. 8, 1973, 1786/73

Int. Cl.² G07F 3/02

U.S. Cl. 194—100 A **63 Claims**



1. A method of examining coins with respect to authenticity including the steps of examining a first unidentified coin by making a measurement with respect to a first characteristic of the coin and thereby producing a first electrical signal having a quality with a first value indicative of the first characteristic of the first coin, comparing the first value with a stored value of the same quality in a programmable memory, and producing a signal indicative of the acceptability of the first coin with respect to the first characteristic when the first value is within predetermined limits for acceptable coins of a given denomination of the stored value.

3,918,566

MECHANISM FOR SEALING COIN INSERTION SLOTS IN TIME VENDING MACHINES OR THE LIKE

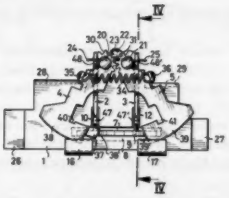
Bernhard Kaiser, Villingen, and Ortwin Wokötck, Schwenningen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed Nov. 15, 1973, Ser. No. 416,249

Claims priority, application Germany, Nov. 16, 1972, 2256069

Int. Cl.² G07F 3/02

U.S. Cl. 194—102 **35 Claims**



1. A mechanism for normally sealing coin insertion slots in parking meters or other types of coin operated machines, comprising a frame defining an aperture for insertion and passage of satisfactory coins having a predetermined shape and size; a plurality of blocking members moveable with respect to said frame and with respect to each other between operative positions in which said blocking members overlie said aperture to thus prevent the insertion of coins or the like, and inoperative positions in which said aperture is at least partially exposed; a single scanning member for each of said blocking members and normally assuming a first position in which said scanning member extends into the path of movement of a satisfactory coin into said aperture, each of said scanning members has at least one scanning face which is located in the path of movement of a satisfactory coin into and through said aperture while the respective scanning member

assumes said first position thereof whereby the satisfactory coin acts upon the scanning face and moves the respective scanning member with respect to said frame to said second position; means on each scanning member for moving the respective blocking member to said inoperative position in response to movement of the scanning member to said second position; and means on each snanning member for locking the respective blocking member in response to movement of the scanning member to said first position.

3,918,567

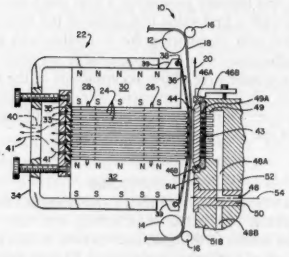
PROCESS PRINTING

Edward D. Kittredge, P.O. Box 32, Concord, N.H. 03301

Filed Mar. 28, 1973, Ser. No. 345,556

Int. Cl.² B41J *3/05*

U.S. Cl. 197—1 R **38 Claims**



1. Process printing apparatus comprising plural transducing blade means,

each blade means having a longitudinally elongated in a direction parallel to a scanning direction continuous leading edge surface portion for hammering movement in a direction perpendicular to said scanning direction toward a recording substrate back face and being activatable by passage of magnetic field and electric current through the blade means to induce said hammering movement,

said leading edge surface portions being in stacked relationship,

reaction anvil means having an elongated forward surface angled with respect to and confronting said leading edge surface portions to receive pressing of a front face of said recording substrate,

means for relatively displacing said anvil means and said stacked leading edges along a longitudinal path generally parallel to said scanning direction while preventing movement of the anvil means in a predetermined direction perpendicular to said scanning direction,

means for passing a common magnetic field through the blade means,

and means for selectively applying pluralities of electrical signals as current through selected ones of said blade means to selectively displace any combination of a plurality of said leading edge surface portions toward said anvil means.

3,918,568

PRINTING MECHANISM

Tadayoshi Shimodaira, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagoya, both of, Japan

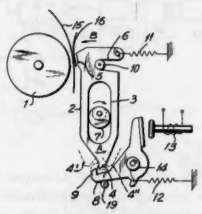
Filed Sept. 8, 1972, Ser. No. 287,373

Claims priority, application Japan, Sept. 10, 1971, 46-70112

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B41J *9/28*

U.S. Cl. 197—49 **1 Claim**



1. A printer comprising a rotatable print drum having an array of print characters on the peripheral surface thereof, oscillatable striking means for selectively striking said print drum for carrying a printable material interposed therebetween into printing contact with said peripheral surface of said print drum, said striking means comprising a reciprocable print hammer having a print face arranged opposite a predetermined portion of said print drum and within striking distance thereof, a stopper guide groove substantially opposite said print hammer face and extending substantially laterally a predetermined distance toward said print face, an interior cam slot substantially perpendicular to said print face and stopper guide groove, and a tooth remote from said print hammer depending downwardly from said striking means; a stopper engageable in said stopper guide groove for limiting a reciprocal return stroke of said print hammer after an imprint is effected, said stopper being fixed relative to the reciprocable movement of said print hammer; means for normally biasing said print hammer against said stopper; a rotatable eccentric cam mounted in said interior cam slot, said cam being unidirectionally rotatable counter to the print stroke direction of said reciprocable print hammer, said cam being arranged to oscillate said striking means about said stopper in a nonprint position of said printer; an impulse responsive trigger lever engageable with said tooth of said striking means for driving said print hammer of said striking means into printing contact with said print drum; biasing means for normally biasing said trigger lever out of engagement with said tooth of said striking means; and means for generating an impulse to which said trigger lever is responsive for driving said trigger lever oppositely of said normal bias thereon for driving said print hammer; said striking means being oscillatable about a point of contact between said trigger lever and said tooth of said striking means in a print position of said printer and said print hammer thereof being simultaneously reciprocable between said print drum and said stopper.

3,918,569

ENDLESS PRINTER RIBBON CARTRIDGE APPARATUS

Ralph L. Parker, Melbourne Beach, Fla., assignor to TRW Inc., Los Angeles, Calif.

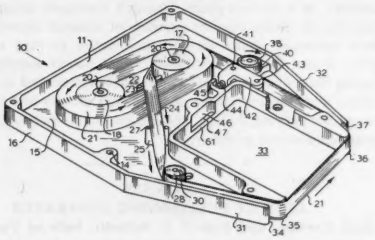
Filed Mar. 18, 1974, Ser. No. 451,951

Int. Cl.² B41J *33/10*

U.S. Cl. 197—168 **7 Claims**

1. An endless printer ribbon cartridge comprising in combination:

a. housing having top, bottom and side walls;
b. a pair of spaced rollers rotatably attached to said housing, at least one of said pair of spaced rollers being a porous inking roller, said ribbon being inked as it passes over said porous inking roller;
c. an endless inked ribbon being partially wrapped around said pair of spaced rollers, for a plurality of turns so as to leave an open space between said rollers;
d. an inside ribbon guide located between said pair of spaced rollers for guiding and twisting said endless ribbon from between said pair of spaced rollers generally perpendicular to and over said wrapped portion;
e. outside ribbon guide means located on the opposite side of said wrapped portion of said endless ribbon from said inside ribbon guide for guiding said ribbon being fed from between said pair of spaced rollers including means for twisting said ribbon into a predetermined path and back onto the outside of said wrapped portion of said ribbon on said pair of rollers;



f. ribbon drive means engaging said ribbon for driving said ribbon over said predetermined path from between said rollers onto the outside of said partially wrapped ribbon on said spaced pair of rollers;
g. said outside ribbon guide means having a ribbon guide having a bottom portion protruding from said bottom wall, and a top portion protruding from said top wall whereby top and bottom portions hold said ribbon therebetween perpendicular to the wrapped portion of said ribbon as it passes over said partially wrapped portion of said ribbon; and
h. said housing also having a pair of protruding arms with said endless ribbon passing therebetween, passing out the end of one said arm and back into said cartridge at the end of said other arm, and each said arm having an opening in the end thereof and a ribbon alignment guide for directing said ribbon passing out one opening and into the other.

3,918,570

CONTAINER STABILIZING APPARATUS

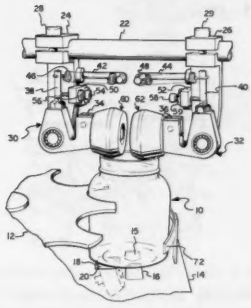
James A. Dunham, Godfrey; August J. Federle, Alton, both of Ill., and Thomas B. Sorbie, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 15, 1974, Ser. No. 442,859
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B23Q 5/22
U.S. Cl. 198—19 **11 Claims**

6. Apparatus for controlling the rotation about its vertical axis of a glass container, having an open mouth defining a rim, at an inspection station by engagement of the heel portion of the container with a rotating drive wheel, comprising, in combination:

a first tapered roller positioned in contact with the inner edge of said rim vertically adjacent the location of said drive wheel;

a second tapered roller positioned in contact with the inner edge of said rim at a location substantially diametrically opposed to that of said first tapered roller; and



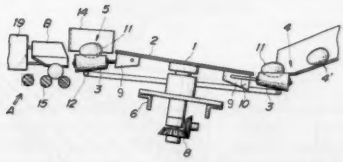
means for rotatably supporting said first and second tapered rollers.

3,918,571

APPARATUS FOR SUPPLYING EGGS AND THE LIKE

Hikoji Noguchi, No. 2605-19 Oaza-Mikajima, Tokorozawa-shi, Saitama-ken, Japan

Filed Mar. 15, 1974, Ser. No. 451,698
Int. Cl.² B65G 47/00
U.S. Cl. 198—25 **4 Claims**



1. An apparatus for automatically transferring substantially spherical objects from a spherical object supply gate to the entrance point of at least one spherical object path conveying means for conveying spherical objects in a row, comprising:

a mounting member rotatably mounted on an axis intermediate the spherical object gate and the entrance point;

a plurality of support rolls;

a plurality of support rods, each of said rods radially extending from said mounting member and pivotably mounted on said mounting member and each of said support rods being rotatably connected to a separate support roll such that each of said plurality of support rolls is rotatable about the longitudinal axis thereof;

each of said support rolls being of frusto-conical configuration and having a diameter increasing with distance from said mounting member;

means for rotating said mounting member; and

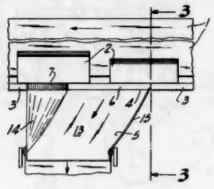
means for rotating said support rolls about the longitudinal axis thereof.

3,918,572

LATERAL DISCHARGE CHUTE AND GATE APPARATUS

Gary J. Wirth, and Kenneth M. Gelder, both of Milwaukee, Wis., assignors to Speaker Motion Systems, Inc., Milwaukee, Wis.

Filed May 9, 1974, Ser. No. 468,230
Int. Cl.[2] B65G 47/34
U.S. Cl. 198—66 9 Claims



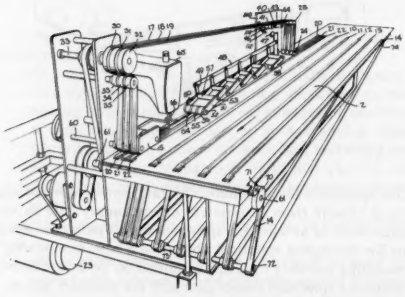
1. A conveying apparatus, comprising a first elongated conveying means of a generally planar support and longitudinally movable for moving a plurality of individual load units in physically longitudinally spaced relationship in one direction and selectively laterally removing of said units from said conveying means at a preselected discharge station, discharge gate means in the lateral path of the load units and defining a stop wall, means for lowering of said gate means with respect to said conveying means and load units to thereby permit lateral discharge, a receiving chute means aligned with the gate means to receive a load unit, and means to move the upper end of the chute means with the gate means.

3,918,573

AUTOMATIC PLEATING DEVICE

Wesley P. Farney, R.D. 1, Soule Road, Holland Patent, N.Y. 13354

Filed Jan. 11, 1974, Ser. No. 432,665
Int. Cl.[2] B65G 15/16
U.S. Cl. 198—165 8 Claims



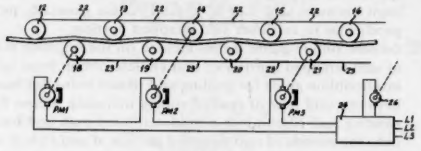
1. Apparatus comprising a table, a plurality of driven endless conveying belts travelling in a selected direction on top of said table; a first plurality of aligned driven endless lower hem belts near an edge of the table and travelling in said direction on top of said table; a second plurality of aligned driven endless upper hem belts of essentially the same length in one-to-one correspondence with said first plurality of hem belts travelling in said direction directly above said first plurality of lower hem belts, each one of said first plurality of belts being aligned with a different respective one of said second plurality of belts and coacting therewith to grip fabric therebetween to convey the fabric in said selected direction.

3,918,574

MULTIPLE D.C. PERMANENT MAGNET MOTOR DRIVE FOR BELT TYPE CONVEYORS

Arthur F. Allison, Aurora, Colo., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 7, 1974, Ser. No. 512,455
Int. Cl.[2] B65G 23/00
U.S. Cl. 198—203 6 Claims



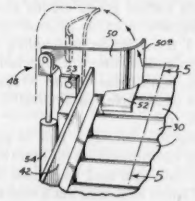
1. The combination with a belt conveyor which includes continuous belts and drive shafts at spaced intervals for transporting articles in a continuous manner from one point to another, of a drive system for such conveyor comprising a plurality of direct current permanent magnet motors having their armature shafts directly connected to said conveyor drive shafts and adjustable electrical power supply means having direct current output terminals connected in a series circuit with the armatures of all of said motors and including means for varying the d.c. voltage impressed across the series connected motor armatures.

3,918,575

ARTICLE POSITIONING APPARATUS

Lloyd Carlson, and Robert A. Schmitt, both of Vancouver, Wash , assignors to Columbia Machine, Inc., Vancouver, Wash.

Division of Ser. No. 330,297, Feb. 7, 1973. This application Sept. 9, 1974, Ser. No. 504,424
Int. Cl.[2] B65G 47/24
U.S. Cl. 198—284 3 Claims



1. Article positioning apparatus comprising

a conveyor operable to support the undersides of a plurality of articles and convey them in succession along a path, said conveyor including a pair of adjacent, substantially parallel, laterally spaced rollers having upper surfaces which define a portion of the conveyor support for articles carried thereover, and

article turning means adjacent said conveyor including an elongate arm projecting laterally into a side of the path along which articles are carried by said conveyor for frictionally engaging and holding an upright side portion of an article to produce rotation of the same about the portion engaged as remainder portions of the article are conveyed along said path and an elongate lifting member secured at one of its ends to said arm and projecting in an upstream direction therefrom over the downstream roller in said pair of rollers in said conveyor and curving downwardly in a region adjacent its opposite end to terminate between said rollers and below the level of the upper surfaces of the roller to present an upper, article-engaging surface, which on progressing away from said arm inclines downwardly from an elevation above the elevation

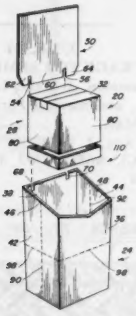
of the article support surface of the conveyor to an elevation below the elevation of the conveyor, said lifting member being operable to raise a portion of the article adjacent said arm from the conveyor with remainder portions of the article remaining supported on the conveyor.

3,918,576

COMBINATION SHIPPING CONTAINER AND DISPLAY SUPPORT

Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust u/a Sept. 1, 1967, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,692
Int. Cl.² B65D *5/50, 5/52, 13/00*
U.S. Cl. 206—44 **6 Claims**



1. A display stand for retention of articles after their removal from their shipping carton,

said stand comprising, in combination,

an upstanding open-ended tubular sleeve of corrugated board, paperboard, fiberboard, plastic, and the like, said sleeve consisting essentially of wall means defining an endless perimetric wall of said stand,

a box-like body nesting within said sleeve and defining a load supporting insert including a platform extending across said tubular sleeve,

said platform constituting a support for articles confined within said sleeve,

said perimetric wall of said sleeve extending upwardly beyond said platform to define therewith a bin-like display, and said load-supporting insert constituting the carton in which the display stand was shipped.

3,918,577

DISPLAY PACKAGING ARRANGEMENT FOR ARTICLES OF MANUFACTURE

Joseph Horzick, West Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

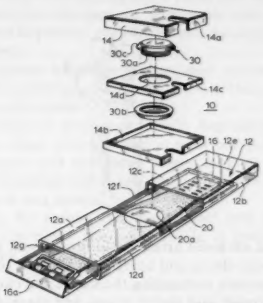
Filed Aug. 29, 1973, Ser. No. 392,837
Int. Cl.² B65D *85/40*
U.S. Cl. 206—45.34 **9 Claims**

1. A display packaging arrangement for transport, storage and visual display of at least two separated component parts of an article of manufacture, said display arrangement comprising in combination:

a first transparent display unit of a substantially elongated configuration for housing one separate component part of said article of manufacture and having an opening intermediate the ends thereof;

a second transparent display unit of a given configuration for matingly fitting in the opening in said first display unit and for housing the other separate component part of said article of manufacture; and

said display units including means interfitting each with the other to provide a single unitary display arrangement in a manner so that one of said separate component parts of said article of manufacture overlies the other of said



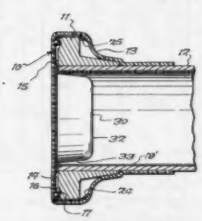
separate component parts and said article of manufacture thereby appears in a substantially assembled relation when said first and second display units are so interfitted.

3,918,578

DESICCANT END CAP

John S. Cullen, Buffalo, and Paul W. Huber, Depew, both of N.Y., assignors to Multiform Desiccant Products, Inc., Buffalo, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,690
Int. Cl.² B65D *81/24*
U.S. Cl. 206—204 **15 Claims**



1. A desiccant end cap for mounting on a member having a face portion and an outer portion extending transversely thereto comprising a cup-like member having an end portion, a rim extending from said end portion for overlying said outer portion of said member, desiccant container means mounted on said end portion, and spacer means for providing an effective clearance space between substantially said entire end portion and said face portion to permit effective communication between said desiccant container means and substantially said entire face portion.

3,918,579

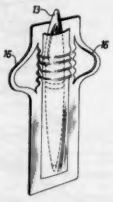
PROTECTIVE WRAPPERS FOR SUBSTANTIALLY SOLID OBJECTS

Marcus Diamant, 30245 Kungsgatan, Halmstad, Sweden

Filed Mar. 30, 1973, Ser. No. 346,580
Claims priority, application Sweden, Apr. 30, 1972, 004256/72
Int. Cl.² B65D *85/02, 85/38*
U.S. Cl. 206—306 **9 Claims**

1. A protective package for an elongated rod-like article such as a clinical thermometer comprising a sleeve formed of thin soft flexible transparent material substantially conforming and enclosing said article, a pull member for opening said sleeve and exposing said article, said pull member being

fixedly joined at two axially spaced attachment points along one side of said sleeve and being adapted to be pulled between said attachment points from said sleeve in a direction away



from said enclosed article, said attachment points remaining fixed to said sleeve and being drawn axially toward each other simultaneously contracting the sleeve and cause said article to break through said sleeve at one end thereof.

3,918,580

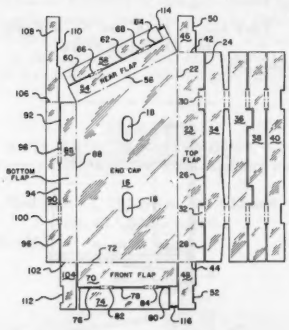
END CAP

Lewis D. Poggiali, Owosso, Mich., assignor to Olinkraft, Inc., West Monroe, La.

Filed May 21, 1973, Ser. No. 362,457

Int. Cl.[2] B65D *85/00, 5/32*

U.S. Cl. 206—320 **14 Claims**



1. An improved three piece bathtub package comprising

a. a wrap-around tube member for encircling the bathtub;

b. a pair of end caps positioned in each end of the tube member for enclosing the ends of the bathtub package;

1. at least one of said end caps comprising a four-sided paperboard member having formed thereon adjacent cushioning flaps, at least one of said pairs of adjacent flaps having formed thereon interlocking means for interlocking the adjacent cushioning flaps together thereby adding torsional stability to the bathtub package, and

2. said interlocking means including an elongated flap having a recessed portion for engagement with the adjacent cushioning flap.

10. An end cap production blank of the type utilized to form a cushioned end cap, comprising:

a. a four-sided paperboard member

b. a top flap, hingedly attached to one side of said member;

1. at least one slit hinge attached to said top flap;

2. a cushioning flap attached to said top flap by said slit hinge;

c. a bottom flap, hingedly attached to another side of said member;

1. at least one slit hinge attached to said bottom flap;

2. a cushioning flap attached to said bottom flap by said slit hinge;

d. a front flap, hingedly attached to a further side of said member,

1. at least one slit hinge attached to said front flap;

2. a cushioning flap attached to said front flap by said slit hinge;

e. a rear flap, hingedly attached to the remaining side of said member,

1. at least one slit hinge attached to said rear flap;

2. a cushioning flap attached to said bottom flap by said slit hinge; and

f. an interlocking flap, formed on and hingedly attached to one of said flaps and having a recessed portion thereon to engage the slit hinge attached to an adjacent cushioning flap, for interlocking the respective flaps together whenever the production blank is formed into a cushioned end cap thereby adding torsional stability to the ends of the package.

3,918,581

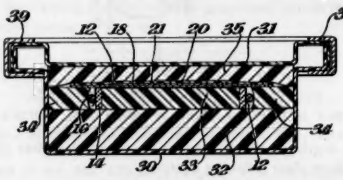
SHIPPING PACKAGE FOR SEMICONDUCTOR CHIPS

Lawrence W. Scammon, Jr., and Leon E. Carlson, both of Concord, N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 2, 1974, Ser. No. 494,143

Int. Cl.[2] B65D *73/02, 81/04, 85/30*

U.S. Cl. 206—334 **6 Claims**



1. A shipping package for semiconductor chips comprising:

a. a frame;

b. a plastic sheet drawn tightly over said frame and fastened thereto;

c. a matrix of spaced semiconductor chips adhering to a surface of said sheet;

d. a film having a metal face lying in contact with a surface of said chips;

e. a compressed resilient cushioning means encompassing the assembly of said frame, said sheet, said matrix and said film for the purpose of holding said film in compressed contact with said chips and for providing a protective cushion for said assembly; and

f. a housing containing said assembly and said compressed resilient means.

3,918,582

CONTAINER FOR SOAKING AND PRESERVING PAINT BRUSHES AND PAINT ROLLER COVERS

Alan D. Wallace, 2295 Washington St., Lemon Grove, Calif. 92045

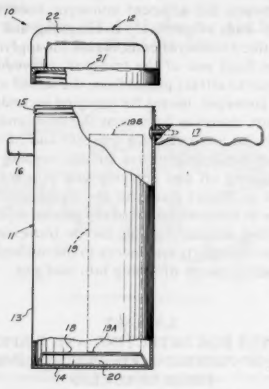
Filed Jan. 22, 1974, Ser. No. 435,600

Int. Cl.[2] B65D *83/10, 81/24, 25/28*

U.S. Cl. 206—362 **1 Claim**

1. A container for soaking and preserving paint brushes and paint roller covers, comprising in combination, a cylindrical, upright container, an opening at an upper end of said container, a screw on cap secured upon an upper end of said container, said screw on cap having a U-shaped handle thereupon, handles being located on diametrically opposite sides of said container for facilitating pouring therefrom, a wire support rested upon a bottom wall of said cylinder, said wire support including a grid portion and a leg portion so that said grid portion is elevated above said cylinder bottom wall, said grid portion serving to support paint roller covers placed thereupon, and an upper portion of said cylinder supporting

a horizontal wire rod extending therethrough, said wire rod being off-set toward one side of a diameter passing through a



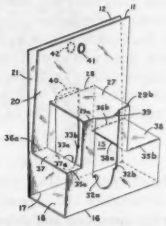
center of said cylinder, said wire rod serving to support paint brushes having openings through a handle thereof for being inserted upon said wire rod.

3,918,583

PACKAGING UNIT FOR THREE DIMENSIONAL ARTICLES AND PACKAGING BLANK FOR FORMING THE SAME

Joseph H. Adams, 648 Valley Road, Brielle, N.J. 08730

Filed Apr. 30, 1973, Ser. No. 355,564
Int. Cl.[2] B65D *73/00, 5/50*
U.S. Cl. 206—491 **9 Claims**



1. In a packaging unit for holding and displaying at least one three dimensional article therein,

a. a packaging blank forming a packaging space for said three dimensional article having, a top edge, a bottom edge and side edges,

b. means on said packaging blank forming a bottom closure for the packaging space having a width equal to the thickness of the article,

c. said packaging blank having a front panel and back panel connected to opposite sides of said bottom closure and foldable about said article,

d. longitudinally disposed means on said packaging blank includes, at least one pair of slits in the packaging blank to form at least one pair of inner edges a spaced distance from each other equal to the horizontal dimension of the article, and said pair of slits disposed intermediate the said side edges of the packaging blank,

e. means on the packaging blank operatively associated with said longitudinally disposed means to form a top closure and at least one pair of side locking panels and said longitudinally disposed means and the means operatively associated therewith coacting to permit said packaging blank to be deformed whereby the front panel and back panel when folded for engagement with each other will be indexed into alignment and will form a packaging space therebetween,

f. said top closure to define with respect to the bottom closure the confining vertical dimension of the packaging space for each article,

g. the inner edges of said longitudinally disposed means to provide the inner edges of said at least one pair of side locking panels and said inner edges defining therebetween the confining horizontal dimension of the packaging space for said article,

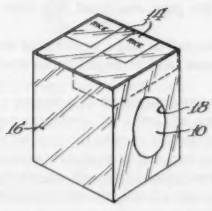
h. and means for sealing said front panel and said back panel to each other after said article is confined and locked in the packaging space.

3,918,584

SHIPPING CASE FOR CARTONS OR CONTAINERS

Larry A. Richardson, Battle Creek, Mich., assignor to Kellogg Company, Battle Creek, Mich.

Filed July 30, 1973, Ser. No. 384,082
Int. Cl.[2] B65D *85/62, 71/00, 65/18*
U.S. Cl. 206—497 **5 Claims**



1. A shipping case adapted to be stacked vertically upon and under other such cases and consisting essentially of the combination of

a. a continuous rectangular sleeve of single or multiple wall corrugated fiberboard, said sleeve being disposed vertically and having an open top and bottom, with the corrugations of said sleeve extending vertically between said top and bottom parallel to the four corners of said sleeve,

b. a plurality of crushable rectangular cartons compression packed in firm contiguous engagement with one another and the four vertical walls of said sleeve, said cartons filling the entire volume of said sleeve and having upwardly and downwardly facing surfaces forming planar surfaces flush with the top and bottom edges of said sleeve, and

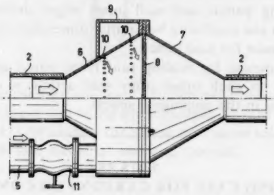
c. a separate continuous sleeve of heat shrinkable polymeric material applied horizontally around and heat shrunk onto said corrugated sleeve, said heat shrunk sleeve including continuous walls overlying and engaging the upwardly and downwardly facing planar surfaces of said cartons at the top and bottom of said corrugated sleeve, and overlying a pair of opposed walls and all eight corners, and at least partially overlying the other pair of opposed walls of said corrugated sleeve,

the combination of said cartons and said sleeves constituting an integral case in which corresponding vertical walls of the cartons are aligned and are parallel with one another and the walls of said corrugated sleeve, and in which the strengths of said cartons and said corrugated sleeve are combined to provide increased vertical stacking strength.

3,918,585
SCREEN DEVICE FOR PNEUMATIC TRANSPORT EQUIPMENT

Clas Hjalmar Hagelstam, Helsinki, Finland, assignor to Oy. Karl Fazer AB, Helsinki, Finland

Filed Sept. 11, 1973, Ser. No. 396,159
Claims priority, application Finland, Sept. 12, 1972, 2508/72
Int. Cl. B03b 1/00; B07b 7/06
U.S. Cl. 209—3 6 Claims



1. A screen device for fine-grain materials, especially flour, to be used in pneumatic transport equipment comprising:

a source of pneumatic pressure;

a transfer pipe connected to said source of pneumatic pressure;

means connected to said transfer pipe for feeding said material into said transfer pipe in order to transport said material along the pipe entrained in a flow of air from said source;

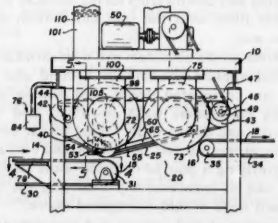
a screen connected to said transfer pipe downstream of said feeding means, and arranged transversely to the transfer pipe; and

stationary means connected to a source of compressed air and defining an array of small apertures, which array extends completely around the interior of a portion of the transfer pipe located immediately upstream of the screen to form a multiplicity of small, closely spaced air streams in order to mix effectively substantially all of said fine-grain material moving towards said screen with the air of said streams thereby to fluidize the fine-grain material, the pressure of the air of the streams being substantially the same as the transport pressure of said flow of air.

3,918,586
SEPARATING APPARATUS FOR FLAT PIECES OF DIFFERENT DIMENSIONS

Reginald E. W. Tyler, New Westminster, and Paul M. Carter, Vancouver, both of Canada, assignors to Durand Machine Company Limited, New Westminster, Canada

Filed Dec. 27, 1973, Ser. No. 428,866
Int. Cl.² B65H 7/16
U.S. Cl. 209—74 R 8 Claims

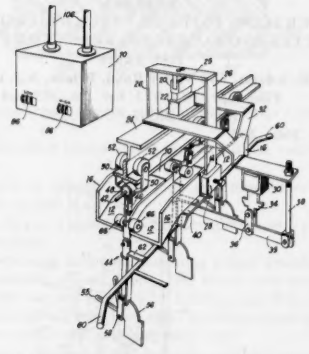


1. Apparatus for separating pieces of sheet-like material having at least predetermined marginal dimensions from other pieces of less than the predetermined marginal dimensions, said apparatus being adapted to be used in association with sensing means which is operable to sense the dimensions of pieces being directed to the apparatus, said apparatus comprising an infeed convenor, an outfeed conveyor having an end adjacent but spaced from an end of the infeed conveyor to leave a gap therebetween, a transport conveyor above and extending between the adjacent conveyor ends and having front and rear ends respectively overlapping and above the infeed and outfeed conveyor ends, means for applying primary suction to the front end of the transport conveyor over the infeed conveyor to attract pieces from the infeed conveyor to the transport conveyor, means for applying secondary suction to the transport conveyor from near the front end thereof to near said rear end and over said adjacent end of the outfeed conveyor, and means responsive to said sensing means for selectively shutting off and applying said primary suction to attract or not to attract pieces to the transport conveyor in accordance with the dimensions of the pieces, said secondary suction retaining attracted pieces on the transport conveyor while the latter transports said pieces to the outfeed conveyor, and non-attracted pieces dropping into said gap.

3,918,587
APPARATUS FOR DETECTING AND DISPENSING ARTICLES OF PRESELECTED WEIGHTS SUSPENDED FROM SHACKLES

Bernard Drew, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed Nov. 16, 1973, Ser. No. 416,517
Int. Cl.² B07C 5/20, 5/28
U.S. Cl. 209—121 5 Claims



1. Apparatus for detecting and dispensing articles of preselected weight suspended from shackles movable along a path by a conveyor line, comprising:

a platform for successively supporting the shackles at a weighing station disposed along the path;

a load cell coupled with said platform to generate an electrical signal indicative of the weight of an article carried by a shackle supported upon said platform;

switching means electrically coupled with said load cell and responsive to the magnitude of signals received from said load cell;

a solenoid coupled with said switching means;

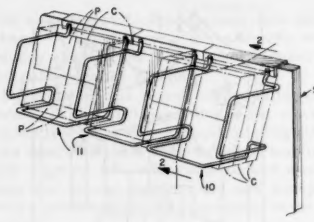
trip lever means coupled with said solenoid to release an article from the shackle weighed on said platform upon actuation of said solenoid;

and wherein said switching means includes a high weight limit comparator circuit including a switch in series circuit with said solenoid, switch actuation means, a manually adjustable rheostat, and a differential amplifier having input terminals coupled with said rheostat and with said load cell and an output terminal coupled with said switch actuation means.

3,918,588
DISPLAY RACK

Ronald D. Walser, and Jerry L. Edmisson, both of Springfield, Mo., assignors to Missouri Farmers Association, Inc., Columbia, Mo.

Filed Nov. 23, 1973, Ser. No. 418,267
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—49 6 Claims

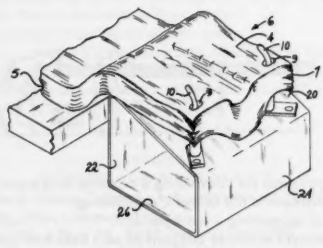


1. A plurality of open, wire display racks disposed in side-by-side juxtaposition for displaying items supported thereon, each rack comprising: an elongate, rigid, inverted channel member having a top wall and depending, spaced apart, parallel front and back walls; an open, rigid wire frame having opposite end portions, said end portions angularly bent and permanently secured to the front wall of the channel member adjacent opposite ends thereof in spaced apart relationship to one another, said wire extending downwardly from said end portions and in a forwardly inclined position relative to said channel member front wall and defining an inclined back support for an item supported and displayed on the rack; at least one of said racks having a wire side support at only one side thereof extending perpendicularly from the plane of the back support to provide side support for said item at one side thereof, and another rack having a wire side support at both sides thereof and disposed in juxtaposition with said one rack at the other side thereof, whereby when the channel members of the racks are positioned on a support with the front and back walls thereof engaged on opposite sides of the support, one of the side supports of said another rack comprises a side support at said other side of said one rack, and the wire racks and items supported thereon are rigidly supported in a downwardly and forwardly inclined position from the support solely by engagement of the channel member thereon.

3,918,589
PIVOTED WICKET BAG OPENING DISPENSER

Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,834
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—57 9 Claims



1. Apparatus for mounting a multiplicity of wicket holed flexible plastic film sheet articles, each having two wicket holes on spaced centers adjacent one edge thereof, for one at a time dispensing, comprising, in combination,

platen means disposed to hold the articles in stacked array,

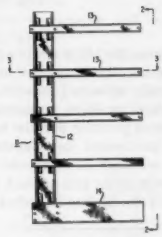
a pair of wicket post means extending upwardly relative to the platen means locatable on spaced centers apart a distance less than the distance between the spaced wicket holes in the sheet articles, and

means to hold the wicket holed portion of the multiplicity of articles elevated relative to the platen means.

3,918,590
DEMOUNTABLE STORAGE RACKS

Thomas N. D'Altrui, 667 Evergreen Parkway, Union, N.J. 07083

Filed July 18, 1973, Ser. No. 380,158
Int. Cl.[2] A47D 5/10
U.S. Cl. 211—176 11 Claims



1. A cantilever storage rack comprising:

a vertical post comprising first and second parallel post walls having opposed inner surfaces joined by a central web, said inner surfaces of the first and second post walls being inclined with respect to the central web;

a substantially horizontal load-bearing arm comprising first and second wall portions adapted to be located on opposite sides of the vertical post parallel to said web;

first and second brackets extending from the first and second wall portions, respectively;

said first bracket bearing against the inner surface of the first post wall;

said second bracket bearing against the inner surface of the second post wall;

the first and second brackets together constituting a wedge with respect to the inner surfaces of the first and second post walls;

and means for clamping the first and second wall portions to the vertical post, thereby to cause the first and second brackets to bear tightly against the inner surfaces of the first and second post walls, respectively.

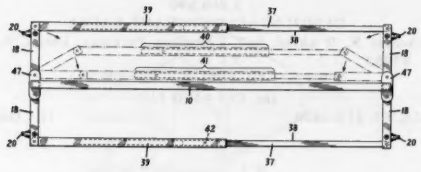
3,918,591
COLLAPSIBLE CLOTHES RACK

Ross E. Cooper, 102-30 66th Road, Forest Hills, N.Y. 11735

Filed Sept. 30, 1974, Ser. No. 510,371
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—178 R 5 Claims

1. A collapsible clothes rack comprising a rectangular frame having horizontal base and top members and vertical side members, each of said side members being comprised of two separable half members, four transverse members, two at each end of said base member and pivotally attached thereto such that said transverse members are on opposite sides of the base member and extend perpendicularly from both the base member and the adjacent side member and adapted to be folded inwardly to a position abutting and parallel to said base member, a base stretcher extending between the outer ends of each pair of transverse members located on the same side of the base member and pivotally attached to said outer ends of said

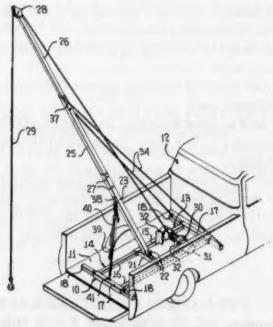
transverse members, each base stretcher comprising two half stretcher members with one of said members slidably received within the other, said one member adapted to telescope farther into the other thereby permitting the transverse members attached to said base stretcher to be folded inwardly until transverse members and the base stretcher extending therebetween are aligned and are parallel to and abutting said base member, releasable locking means on each base stretcher adapted to prevent said half stretcher member from telescoping when said transverse members are in a position perpendicular to said base member, the lower half member of each side member being pivotally attached to said base member and foldable from a vertical position perpendicular to said base member to a horizontal position parallel to and abutting said base member, said horizontal top member being separable from each top half member of each said side member, and casters mounted on the outer end of each transverse member and adapted to permit the rack to be rolled about on the floor



3,918,592
CRANE HOIST ATTACHMENT FOR THE BED OF A TRUCK

Jim N. Paul, 324 E. Locust St., Tyler, Tex. 75701

Filed Nov. 11, 1974, Ser. No. 522,430
Int. Cl.² B66C *23/00*; B60P *01/46*
U.S. Cl. 212—8 R **13 Claims**

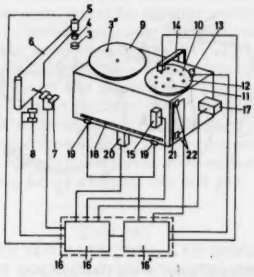


1. A crane attachment for pick-up trucks and the like comprising a horizontal mounting base attachable directly to a truck bed, said base comprising fore and aft telescoping longitudinally adjustable base sections and fore and aft laterally adjustable telescoping outrigger bars on said base sections, said outrigger bars adapted for direct bolting to a truck bed, power hoist mounting bracket means on the forward base section, a crane boom, means to secure the base of the crane boom to said mounting base, guy cable means interconnecting said boom with the forward end portion of the mounting base, and opposing adjustable tension means interconnecting said boom with the forward end portion of the mounting base, whereby said boom is stabilized in an erected position of use, said boom having a sheave for a hoisting cable.

3,918,593
ARTICLE HANDLING AND TRANSFERRING MACHINE

Roland T. A. Kaufeldt, Nykoping, Sweden, assignor to Monark-Crescent AB, Varberg, Sweden

Filed Nov. 26, 1973, Ser. No. 419,086
Int. Cl.² B65G *61/00*
U.S. Cl. 214—1 BH **8 Claims**

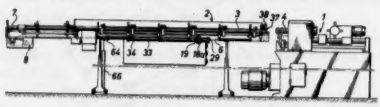


2. An article handling and transferring machine comprising a rotative and vertically movable manipulator arm means, gripping means disposed at one end of said arm means for seizing and holding the article at a pick-up station, means for moving said arm to a delivery station and releasing said gripping means there to always deliver said article in one and the same fixed geometrical position, said delivery station comprising a horizontally extending delivery plate, means for supporting said plate for motion in two different horizontal directions under said fixed position, one of said horizontal motions being a linear motion and the second of said horizontal motions being a motion directed transversely to said first motion, both of said motions moving said plate under said fixed geometrical position, and programming means comprising a horizontally extending control plate indexed in a manner similar to the desired incremental movement of said delivery plate for causing such movement of the delivery plate between each delivery of an article to it, whereby said delivery plate may experience said motions in the two different horizontal directions.

3,918,594
APPARATUS FOR FEEDING ELONGATED MATERIAL TO A MACHINING TOOL

Roland Durst, Wendlingen (Neckar), and Kurt Schweizer, Reichenbach, both of Germany, assignors to Hermann Traub, Germany

Filed Oct. 17, 1974, Ser. No. 515,466
Claims priority, application Germany, Oct. 23, 1973, 2353000
Int. Cl.² B23Q *5/22*
U.S. Cl. 214—1.5 **8 Claims**



1. Apparatus for controlling a machine tool having an elongated workpiece fed thereto, comprising:

a base supporting a workpiece;

a conveyor member coupled to said base and arranged for movement in first and second directions;

a thrust rod coupled to said conveyor member and disposed to contact and move the workpiece toward the machine tool;

means for permitting said thrust rod to move the workpiece toward the machine tool;

a control member coupled to said base for movement between a first and second position;

a connecting element movably supported on said base and coupled to said control member;

coupling means, connected to said connecting element and releasably connected to said conveyor member, for imparting movement to said connecting element when actuated;

means for actuating said coupling means while said control member is in said first position to thereby move said connecting element and said control member coupled thereto to said second position;

means for actuating said means for permitting to initiate movement of the workpiece toward the machine tool concurrently with actuation of said coupling means;

means for deactuating said coupling means and for actuating the machine tool when said control member has reached said second position, and said workpiece has reached a predetermined position relative to the machine tool; and

means for moving said control member from said second position to said first position, said means for moving including a biasing element coupled to said connecting element.

3,918,595

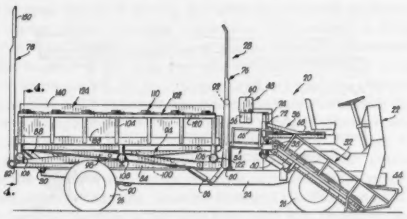
BALE HANDLING MACHINE

Vern L. Godfrey, and Bill D. Clark, both of Rte. 4, Warrensburg, Mo. 64093

Division of Ser. No. 274,337, July 24, 1972, Pat. No. 3,826,389. This application June 14, 1974, Ser. No. 479,408

Int. Cl.² B65G *57/28, 57/32*

U.S. Cl. 214—6 B **13 Claims**



1. In article handling apparatus:

an article receiver tiltable between loading and unloadin positions and including a pair of opposed, spacedapart, inclinable retainers defining confines of the receiver for disposition of a load of articles therebetween;

mechanism for canting said receiver by inclining said retainers for reducing the effective height of the receiver during tilting thereof between said positions;

elevated article holding structure; and

a pusher for raising successive tiers of articles to said structure when the receiver is in its loading position and for displacing articles as a stack from the receiver when the receiver is in its unloading position.

3,918,596

SCHOOL BUS INVALID LIFT

David Henry Ward, Conway, Ark., assignor to Ward School Bus Mfg., Inc., Conway, Ark.

Filed May 14, 1974, Ser. No. 469,905

Int. Cl.² B60P *1/44*

U.S. Cl. 214—75 R **1 Claim**

1. An invalid lift attachment for school busses, the combination comprising:

a. an opening in the side of and extending into the interior of said school bus, said opening closeable by swinging doors on the side of said school bus,

b. two pair of box-shaped guide channels secured vertically to said school bus and positioned in the interior said opening,

c. a carriage means guided for vertical movement on said guide channels comprising

1. two vertical plates each having at each side edge a vertical U-shaped channel attached thereto each of said U-shaped channels accepting therein one of the box-shaped guide channels for sliding relative movement,

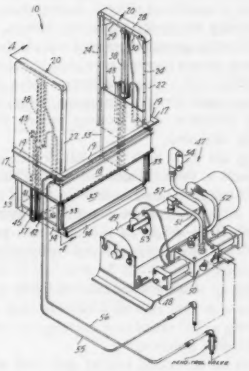
2. said vertical plates lying in a vertical plane which is transverse to the direction of travel of said school bus,

3. a horizontal platform rigidly connected to said vertical plates for supporting a wheel chair and having attached thereto a pivoted ramp which when pivoted to the vertical position closes off the lower open end of said carriage means,

4. power means for raising and lowering said carriage means comprising,

a. a pair of endless chains on each side of said carriage trained over an upper and lower sprocket,

b. a shaft connecting each of said upper sprockets and a shaft connecting each of said lower sprockets,



c. a pair of hydraulic cylinders, the piston rod of each pivotally connected to each side of said carriage whereby said chains and sprockets and shafts ensure equal travel of each side of the carriage,

d. each of said pair of box-shaped guide channels being connected across the top thereof by a connecting beam,

e. each of said pair of said hydraulic cylinders having cylinder portions pivotally connected to a respective connecting beam and having the lower end of said cylinder portions connected to the respective endless chains,

f. a control system for controlling the supply of fluid to the hydraulic cylinders comprising,

1. an electrically actuated fluid pump,

2. a four way valve to control the fluid flow from said pump to said hydraulic cylinders,

3. a flexible cable having a control portion at one end having thereon two electric switches to control the carriage movement whereby said flexible cable is placed in a position in close proximity to said carriage enabling the wheelchair operator to operate the carriage while being supported and elevated by said carriage.

3,918,597

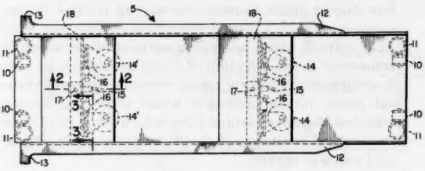
METHOD OF MOVING A HEAVY LOAD

William Smith Lee, New Orleans, La., assignor to Lee Inventions, Inc., New Orleans, La.

Continuation-in-part of Ser. No. 189,337, Oct. 14, 1971, Pat. No. 3,809,261, which is a division of Ser. No. 9,223, Feb. 6, 1970, Pat. No. 3,633,774. This application May 7, 1974, Ser. No. 467,781

Int. Cl.[2] B65G *67/02*; B62B *3/02*

U.S. Cl. 214—152 **9 Claims**



1. The method of providing a heavy load, supported on a surface by peripheral support members and having a substantial, intermediate portion of its bottom area offset a relatively small height from the surface on which it rests, with means for easy locomotion comprising the following steps:

providing a sled having a relatively small height with an upper load-bearing surface and at least two sets of vertically movable, intregal, heavy-duty carriage members carrying heavy-load-bearing wheels, at least one set of said carriage members and wheels during use of the sled being always located completely below said load-bearing surface and within the lateral sides of said sled and between said lateral support members, in a raised, inoperative position, and jacking means structurally separate from said sled;

sliding the sled with said sets of carriage members and wheels in their raised, inoperative position with said one set always located below said load-bearing surface and the offset bottom area of the load and between the lateral support members of the load into position beneath the offset bottom area of the heavy load, in juxtaposition thereto;

jacking up a first end of said sled with said separate jacking means so that said load rests in part on said first end;

lowering a first set of said carriage members into a lowered, operative position;

jacking up a second end of said sled with suitable jacking means so that the load is now fully carried by said sled; lowering a second set of said carriage members into a lowered, operative position; and

removing said jacking means so that the heavy load now rests on the wheels of said carriage members through said sled and is free to roll thereon.

3,918,598

METHOD FOR POSITIONING AND ORIENTING PALLETIZED ARTICLES

Richard H. VanderMeer, Golden, and Robert L. Simmons, Lafayette, both of Colo., assignors to Goldco, Industries Inc., Golden, Colo.

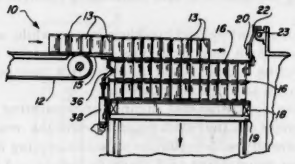
Division of Ser. No. 390,639, Aug. 22, 1973. This application Jan. 9, 1975, Ser. No. 539,660

Int. Cl.[2] B65G *57/24*

U.S. Cl. 214—152 **4 Claims**

1. A method of palletizing articles in vertically spaced tiers with a separator sheet between each tier comprising:

conveying a plurality of articles onto a support surface and into contact with article positioning guide members located adjacent three edges of the support surface to form a tier of such articles, retracting the positioning guide members upon completion of formation of the tier of articles, lowering the tier of articles a distance substantially equal to the height of the articles, placing a separator sheet on the upper surface of the tier of articles to form a support surface, concurrently extending separator sheet locating surfaces and orientation guide members connected to said separator sheet locating surfaces to



locate the separator sheet and orient and square the lower tier, repositioning the positioning guide members, and conveying additional articles onto the separator sheet to bear upon and lock the oriented articles in the lower tier in position.

3,918,599

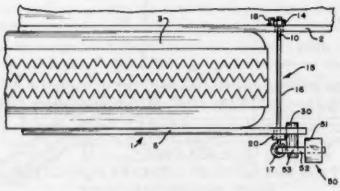
SAFETY AND SECURITY DEVICE

James A. Porter, Rte. 1, Box 255, Farmington, Mo. 63640

Filed Feb. 3, 1975, Ser. No. 546,269

Int. Cl.[2] B62D *43/04*

U.S. Cl. 214—454 **5 Claims**



1. In a vehicle with a rack by which a spare tire is mounted on the underframe of the vehicle, said rack including an arm upon which said tire is supported, said arm having a keyhole slot in it and said rack including an eye bolt swingably mounted on said frame at one end and depending therefrom, said eye bolt having an eye on its lower end and a shank threaded through at least a part of its length and a a shoulder on said shank above said eye, said keyhole slot being of a size in a larger part to pass said shoulder and eye and in a smaller part to admit said shank but to prevent passage of said shoulder, the improvement comprising in combination with said arm and said eye bolt, an elongated plug, said plug having an upper part of a size too large to pass through said large part of the keyhole slot and a lower part of a size to pass through said large part of the keyhole slot but too large to pass through the said smaller part of the keyhole slot, said lower part having a passage extending transversely entirely therethrough; and lock means mounted on and carried by said plug, said lock means having a shackle with a straight segment of a size to pass through said passage, and a cross segment of a size to pass through said eye, said plug projecting through said large part of the keyhole slot a distance sufficient to permit said shackle to extend through the said passage and said eye.

3,918,600

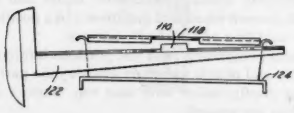
APPARATUS FOR HANDLING ARTICLES

Gilbert T. Lyon, 22501 Rio Vista, St. Clair Shores, Mich. 48081

Continuation-in-part of Ser. No. 151,249, June 9, 1971, abandoned, which is a continuation of Ser. No. 22,124, March 31, 1970, abandoned, which is a continuation of Ser. No. 569,161, Aug. 1, 1966, abandoned. This application Nov. 5, 1973, Ser. No. 412,778

Int. Cl.[2] B65G 47/00

U.S. Cl. 214—750 12 Claims



6. In combination, a fork lift truck having a pair of laterally spaced forwardly projecting fork members each having an upwardly facing tote pan supporting edge, an article-carrying generally rectangularly shaped tote pan adapted to carry small but relatively heavy articles, said pan having a bottom and two pairs of opposed side walls joined at their side edges to form the four corners of the tote pan, at least one of said two pairs of opposed side walls sloping upwardly and outwardly from said bottom and each having an outwardly projecting continuous flange along its upper edge, said fork members being laterally spaced apart a distance greater than one dimension of the bottom of the tote pan and substantially equal to the same dimension of the pan as measured between the opposed sloping side walls adjacent to the flanges thereof and such that the two flanges seat respectively over the said tote pan supporting edges of the spaced fork members of the fork lift truck, each said fork member having a thickness not greater than the width of the flange which it supports and a vertical dimension less than the distance between the flange which it seats and the bottom of the tote pan, each said flange further having a slot therethrough disposed intermediate the opposite ends thereof and extending parallel to the side wall from which the flange projects, said fork members having upwardly projecting lugs registrable with and shaped to be received in said slots, each said lug having a horizontal dimension paralleling its fork member which is greater than its height and a height which is greater than the thickness of the slotted flanges with the result that when the lug is fully received in the slot of one of the flanges its upper section will visibly project above the flange, said flanges having their undersides unobstructed throughout their respective lengths including their opposed ends whereby said fork members are receivable linearly through said two opposed open unobstructed ends of the flange portions and whereby such fork members are shiftable upwardly against the flanges into seating position thereunder to support the tote pan with the upwardly projecting lugs fully received within said slots with which they register whereby the pan is interlocking positioned longitudinally and transversely relative to the fork members as the fork members engage and lift the pan, said fork members being engageable with the sloping side walls of the pan during such upward shiftable movement of the fork members thereby to laterally adjust the pan and fork members relative to one another and thus vertically align the flanges with the fork members upon which they seat.

3,918,601

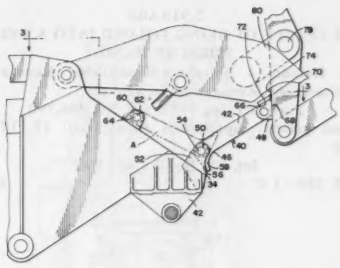
LINKAGE RESTRAINING SAFETY DEVICE

Richard F. Zimmerman, Waukegan, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 15, 1974, Ser. No. 488,354

Int. Cl.[2] E02F 3/36

U.S. Cl. 214—776 3 Claims



1. In combination, a vehicle, an implement, a boom, an implement linkage arrangement movably securing said implement to said boom, a hydraulic cylinder for actuating said implement through said linkage, a bracket attached to said linkage in the force transmission path from said cylinder to said implement, at least one linkage locking means including a lever having first and second abutting ends, said first abutting end being pivotally secured to said vehicle and said second end being swingable to abuttingly engage said bracket means when said linkage is orientated in a given position.

3,918,602

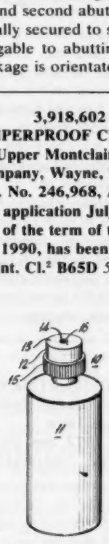
TAMPERPROOF CLOSURE

James A. McIntosh, Upper Montclair, N.J., assignor to Mack-Wayne Plastic Company, Wayne, N.J.

Continuation of Ser. No. 246,968, April 24, 1972, Pat. No. 3,756,444. This application July 10, 1973, Ser. No. 378,114The portion of the term of this patent subsequent to Sept. 4, 1990, has been disclaimed.

Int. Cl.[2] B65D 55/02

U.S. Cl. 215—219 10 Claims



2. A tamperproof closure for a container of the type having a threaded neck, said closure comprising an inner cap having a first top wall and an internally threaded first cylindrical skirt extending therefrom for engaging the threaded neck of the container, said closure further comprising an outer cap having a second top wall and a second cylindrical skirt extending therefrom, said second skirt being positioned to surround said first skirt, a projection extending from said first top wall toward said second top wall, a aperture in said second top wall aligned with said projection, said projection having a base portion adjacent said first top wall of smaller cross sectional dimension than said aperture and an end portion of greater cross sectional dimension than said aperture, whereby said projection holds said second top wall in a first position spaced

from said second top wall and said second top wall may be forced toward said first top wall with said projection extending through said aperture to a second position, and engaging means on said inner and outer caps positioned to permit free relative rotation of said inner and outer caps in said first position and to transmit rotary movement from said outer cap to said inner cap in said second position.

3,918,603

CAN CAPABLE OF BEING FOLDED INTO A DEFINITE FORM BY HAND

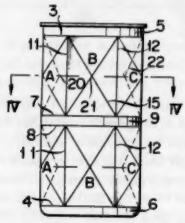
Michio Hatada, 1 Shirahata-Higashi-cho, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Oct. 16, 1973, Ser. No. 406,790

Claims priority, application Japan, Oct. 17, 1972, 47-103195

Int. Cl.² B65D *1/40, 7/42*

U.S. Cl. 220—1 R **6 Claims**



1. A cylindrical can capable of being folded into a predetermined shape by hand, said can comprising parallel first grooves spaced from the top and bottom ends of the can wherein ring strips are formed on the side of said can between said first grooves and the top and bottom of said can, at least one pair of spaced second grooves, parallel to said first grooves and positioned therebetween, a plurality of third grooves spaced at equal intervals around said can and running between each said first groove and an adjacent said second groove perpendicular thereto wherein the space formed between said second grooves in each said pair of second grooves has no third grooves therein, diagonal grooves extending between the corners in the quadrilateral formed by said first, second and third grooves, and short grooves formed along the circumference of the cylinder at each mid-point of each said third grooves, perpendicular thereto.

3,918,604

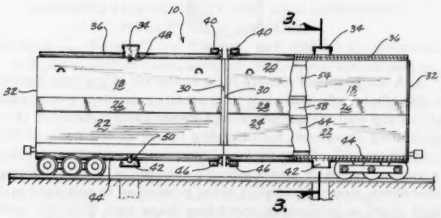
CONVERTIBLE COMPARTMENT CONTAINER

Herbert H. Kersten, Fort Dodge, Iowa, assignor to Tekko Corporation, Fort Dodge, Iowa

Filed Dec. 6, 1973, Ser. No. 422,439

Int. Cl.² B61D *5/02, 7/02;* **B65D** *7/40, 57/00*

U.S. Cl. 220—22 **4 Claims**



1. A combination cargo compartment for liquid and granular materials, comprising,

a container having upper and lower ends, a pair of spaced apart side walls and a pair of spaced apart end walls,

a movable partition in said container secured to and extending between the upper and lower ends of said container so as to divide said container along its central axis forming a seal between the end walls and the partition,

said container having liquid inlet and discharge openings formed therein in communication with one side of said partition,

said container having granular inlet and discharge openings formed therein in communication with the other side of said partition,

said partition being automatically movable from a first position adjacent one of said side walls to a second position adjacent the other of said side walls in response to loading pressure exerted thereon by one of the liquid or granular materials so that said container may accommodate liquid material therein when said partition is in its said first position and accommodate granular material therein when said partition is in its said second position, said movable partition also permitting said container to simultaneously accommodate both liquid and granular materials therein when said partition is in a position intermediate said first and second positions,

said partition comprising rigid flat portions interconnected by flexible and pliable members whereby the partition has a mating configuration with said top, bottom and side walls when juxtaposed.

3,918,605

COMBINATION CONTAINER WITH DISPOSABLE CLOSURE AND LINEAR ASSEMBLY

Calvin J. Butler, Rte. 2, Box 100, Bend, Oreg. 97701

Filed Apr. 15, 1974, Ser. No. 460,692

Int. Cl.² B65D *25/14*

U.S. Cl. 220—63 R **17 Claims**

1. A combination container with disposable closure and liner assembly wherein

said container comprises a wall having a formed opening extending therethrough with marginal edges surrounding said opening defining inwardly and outwardly facing lip surfaces, said formed opening having major and minor side-to-side dimensions as measured along angularly disposed lines extending in the plane of the wall, with said major dimension being greater than said minor dimension,

said closure comprises a member adapted to fit in and close said opening, said closure having a lower section adapted for insertion through said opening when in one position relative to said opening and being adapted upon rotation to a second position following insertion for engaging said inwardly facing lip surface, said lower section of said closure having first and second side-to-side dimensions as measured along angularly disposed lines in a plane parallelling the plane of the wall, with said first dimension being greater than said minor dimension but less than said major dimension, and said second dimension being less than said minor dimension, an upper section overlying said outwardly facing lip surface, sealing means interposed between said upper section and said outwardly facing lip surface, a bore extending through said member from the exterior to the interior of said container, and removable plug means for closing said bore, and

said liner comprises a pliable, collapsible bag having a continuous body and neck integral with said body, said neck being fixedly secured to said closure about the inner end of said bore.

3,918,606

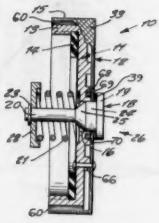
FUEL TANK FILLER CAP

Russell D. Keller, 10360 S.E. Mather Rd., Clackamas, Oreg. 97015

Continuation-in-part of Ser. No. 414,116, Nov. 8, 1973, abandoned. This application Mar. 6, 1974, Ser. No. 448,492

Int. Cl.² B65D 51/16, 51/18; F16K 17/04

U.S. Cl. 220—208 4 Claims



1. A cap for a vertical filler pipe of the fuel tank of a vehicle comprising:

an inner shell having a flat portion adapted to extend horizontally across the end of a filler pipe and a peripheral flange to surround and engage with the filler pipe;

a first vent passage through said inner shell flat portion for permitting the flow of air into said tank in the normal operation thereof;

first valve means for said first vent passage adapted to seal the same upon tilting of said cap a predetermined amount from its normal position;

said first valve means comprising a valve member having a stem slidably engaged in said vent passage and a head upon its lower end of larger diameter than said vent passage;

a ball positioned beneath said head;

and a ball retainer positioned beneath said ball;

said ball retainer being cup-shaped with a lowermost center portion concentric with said stem and converging in all directions outwardly from said center portion toward the lower surface of said shell flat portion;

the lowermost center portion being spaced beneath said lower surface a distance such that said valve means head, when resting on said ball, is displaced from said lower surface thereby to permit air to flow through said vent passage;

said retainer converging toward said lower surface such that, upon tilting of said cap beyond a predetermined angle in any direction, said ball will force said head into engagement with said lower surface;

a cover surrounding said inner shell;

rib means extending between said cover and the outer surface of said inner shell flat portion to space said cover from said surface and provide an air passage therebetween;

said inner shell flange having grooves in the outer surface thereof communicating with said air passage for permitting air to flow between said air passage and the atmosphere;

a second vent passage through said inner shell flat portion spaced from said first vent passage;

second valve means for said second vent passage adapted to seal the same upon seating therein;

said spring means connected between said inner shell and said second valve means for normally seating said second valve means in said second vent passage and allowing said valve means to unseat upon an increase of pressure in said tank beyond a predetermined amount.

3,918,607

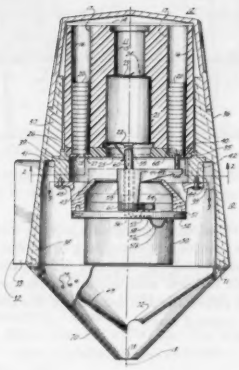
CHEMICAL DISPENSING SYSTEM

John J. Rowlette, Arcadia, Calif., assignor to Duane D. Erway, Rochester, N.Y., a part interest

Filed Feb. 22, 1974, Ser. No. 444,826

Int. Cl.² B65G 59/06

U.S. Cl. 221—15 30 Claims



1. A swimming pool chemical dispensing system comprising:

a cartridge for storing tablets of a swimming pool chemical;

a dispenser housing into which the cartridge removably fits;

means for attaching the housing to the edge of a swimming pool;

a battery having a positive terminal and a negative terminal disposed in the cartridge;

means disposed in the housing including an electrical clock motor for dispensing tablets stored in the cartridge into the swimming pool responsive to the power source; and means operable when the cartridge is positioned in the housing for transmitting power from the source to the dispensing means to dispense tablets stored in the cartridge, the power transmitting means comprising an electrically conductive spring contact extending from one terminal of the battery to a point at the periphery of the cartridge, an electrically conductive hollow tube mounted in the dispenser housing, the tube extending from the cartridge to the clock motor such that the spring contact engages the tube in deformation, an electrical conductor extending through the tube from the cartridge to the clock motor, an electrically conductive disc contact at the end of the tube adjacent to the cartridge positioned to engage the other terminal of the battery, spring means urging the disc contact into engagement with the other contact of the battery, and means for connecting the conductor and the tube to the clock motor.

3,918,608

DISPENSING CARTON

Rudolph A. Faller, Edina, Minn., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.

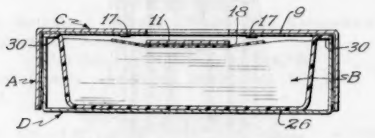
Division of Ser. No. 335,707, Feb. 26, 1973, abandoned. This application Sept. 5, 1974, Ser. No. 503,393

Int. Cl.² A47K 10/20

U.S. Cl. 221—63 2 Claims

1. A dispensing carton for a product including:

a closure panel,
an open topped tray including said closure panel and marginally secured thereto,
a removable area spaced from the edges of said panel and defined by an endless weakened line of separation,
a film underlying said panel and secured to said removable area and portions of said panel outwardly of said removable area,



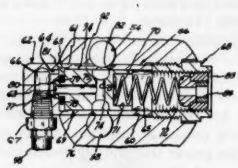
an endless line of adhesive outwardly of said weakened line of separation completely encircling the same,
said cover panel including opposed side walls hinged to opposite sides thereof, and anchoring flanges hinged to said opposed side walls and secured to the under surface of said open topped tray.

3,918,609

MARKING DEVICE FOR TORQUE APPLYING TOOL

Rudolph G. Peterson, Detroit, Mich., assignor to Carco, Inc., Detroit, Mich.

Division of Ser. No. 147,456, May 27, 1971, Pat. No. 3,802,301. This application Sept. 24, 1973, Ser. No. 400,382
Int. Cl.² B67D *5/14*
U.S. Cl. 222—61 **6 Claims**



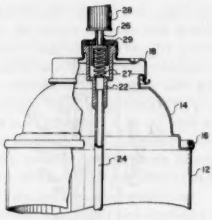
1. A marking device adapted to eject a marking fluid unto a workpiece upon completion of a predetermined operation being performed upon said workpiece, said operation requiring a fluid pressure system and an increase in the pressure within said system to a predetermined value being achieved upon completion of said operation, said marking device comprising:
a reservoir of said marking fluid;
a feed passage having an inlet in communication with said reservoir and an outlet through which said marking fluid is ejected;
means for closing communication between said reservoir and said feed passage for separating the fluid in said feed passage from the fluid in said reservoir; and
means responsive to the pressure in said fluid pressure system achieving a predetermined value indicating the completion of the operation on said workpiece to pressurize said separated fluid in said feed passage to forcibly eject said separated fluid through said feed passage outlet.

3,918,610

SAFETY VENT FOR A PRESSURE CONTAINER

Wilburn C. Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 23, 1974, Ser. No. 517,325
Int. Cl.² B65D *83/14*
U.S. Cl. 222—397 **12 Claims**



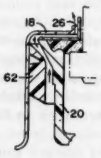
1. A safety vent for a pressurized container comprising a container wall having an integral concavity therein, an integral hollow bridge interrupting said concavity, and spanning opposed sidewalls thereof, and a weakening line in the container wall transversely across said bridge, whereby excessive pressure in a container will stress said bridge to fracture the residual metal in said weakening line across the bridge and permit venting of the container.

3,918,611

PRESSURE RELIEF SYSTEM FOR AN AEROSOL DISPENSER

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Div. of Pittway Corporation, Cary, Ill.

Division of Ser. No. 160,645, July 8, 1971, Pat. No. 3,791,561. This application Nov. 19, 1973, Ser. No. 416,803
Int. Cl.² F16K *17/02*
U.S. Cl. 222—396 **9 Claims**

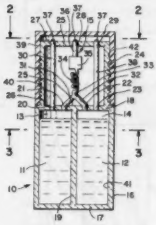


1. A pressure relief system for an aerosol dispenser of the type utilizing a valve body, said pressure relief system comprising at least one turret formed on the dispenser, said pressure relief system including flexible sealing means comprising an annular ring having a pressure control means formed thereon, said pressure control means disposed and configured to control a pressure relief point, said flexible sealing means mounted internally in said turret and in sealing engagement with the internal wall surface of said turret and the external wall surface of said valve body, said flexible sealing means disposed to seal at least one vent port disposed in fluid communicating relation between the exterior and interior of said dispenser, said pressure control means arranged relative to said vent port such that the interior pressure of said dispenser acts directly against said flexible sealing means to break said sealing engagement of said flexible sealing means with either the interior wall surface of said turret or the exterior wall surface of said valve body at the predetermined pressure release point.

3,918,612
SOLUTION OF SUN SCREENING AGENT AND INSECT REPELLENT WITH DISPENSING BOTTLE

Anthony Voulgaris, Riverdale, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 21, 1974, Ser. No. 516,214
Int. Cl.² B67D 5/60
U.S. Cl. 222—144.5 4 Claims



1. A dispensing bottle for dispensing and mixing two solutions, which comprises:

a. a casing having a closed base, and upwardly extending cylindrical sidewall, an interior chamber therein, and a closed top, said top having first, second, third and fourth apertures therethrough;

b. a divider contained in said chamber, said divider affixed between said base, said top, and said cylindrical sidewall, said divider dividing said chamber into a right and a left interior chamber, said right interior chamber communicating with first and second said apertures, and said left interior chamber communicating with said third and fourth apertures;

c. a cylinder sleeve having a second closed top and an open base, a bottom periphery of said cylinder sleeve affixed to said closed top of said casing, said second closed top of said cylinder sleeve having fifth, sixth, and seventh apertures therethrough;

d. a first tube communicating between said first and said fifth apertures;

e. a second tube communicating between said fourth and said seventh apertures;

f. a fork shaped tube having a spiral shaped leg and a pair of arms, said arms communicating with said second and third apertures;

g. a bulb element communicating with a free end of said spiral shaped leg;

h. a third tube communicating between said bulb and said sixth aperture;

i. a liquid A adapted to be received in said left interior chamber;

j. a liquid B adapted to be received in said right interior chamber; and

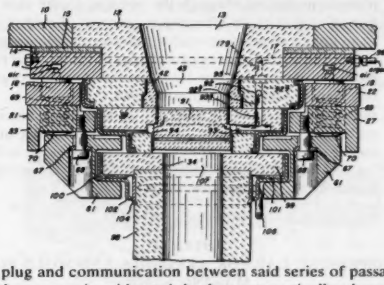
k. means for restricting a flow of said liquid A through said first tube, said liquid B through said second tube, and a mixture of said liquids A and B through said third tube.

3,918,613
SLIDING GATE HAVING SELECTIVELY OPERABLE GAS LINE FOR POROUS PLUG

Earl P. Shapiand, Jr., Champaign, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 337,252, March 1, 1973, Pat. No. 3,866,806. This application Jan. 10, 1974, Ser. No. 432,370
Int. Cl.² B22D 37/00
U.S. Cl. 222—148 3 Claims

3. In a slidable gate mechanism wherein the gate has a permeable plug through which gas can be introduced to the outlet of a vessel, an improved means for conducting gas to said plug, said means comprising a series of passages through stationary parts of the mechanism and a passage in said gate communicating with said plug and with said first-named passages when said plug is positioned under said outlet, whereby the need is avoided for flexible connectors to conduct gas to

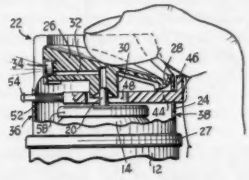


said plug and communication between said series of passages and the passage in said gate is broken automatically when said gate moves to a position in which said plug is away from said outlet.

3,918,614
CHILDPROOF ACTUATOR CAP

Wolf Steiman, Bridgeport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Jan. 17, 1974, Ser. No. 434,331
Int. Cl.² B65D 83/14; B67D 5/32
U.S. Cl. 222—153 1 Claim



1. A childproof actuator cap for a hand-held aerosol dispenser having a container with a top closure and a valve assemblage, including a valve stem, carried by said closure member comprising in combination:

a. a cap body having a top wall provided with an elongated opening therein and having an annular, integral skirt, with a front and rear portion, depending from said top wall and engageable with and adapted to be supported by the container;

b. an elongated depress button disposed within said elongated opening in said top wall portion of said cap body and hingedly connected thereto at its rear end, said button being movable between a raised, non-discharging position and a depressed, discharging position, and having means engageable with said valve stem for actuating said valve in response to depressing movement of the button by the user's finger;

c. means on the cap top wall for positioning a user's finger in a direction extending between said front and rear portions of said cap skirt thereby adapting it to depress said button;

d. a plunger having its front and rear ends received in opposed openings provided in the front and rear portions of said skirt below said means engageable with said valve stem provided on said depress button, said plunger having an opening therein receiving said valve stem, said opening being defined by a straight, transverse front wall and a semicircular rear wall connected by straight, parallel sidewalls provided on said plunger, the front end of said plunger having an integral, cylindrical boss carrying a spiral spring in compression which normally forces said

transverse front wall against said stem to prevent said depress button from being actuated;

e. an external finger piece connected to the rear end of said plunger projecting through the opening in the rear portion of said skirt for effecting movement of said plunger to an unlocked position enabling depressing movement of the button and actuation of the valve to occur, said finger piece having an upturned end terminating adjacent the rear end of said depress button; and

f. said finger piece being disposed at a location placing it under the same finger employed to depress the button during the use of the dispenser, whereby both the unlocking and actuating operations can be simultaneously effected by the same finger.

3,918,615

DISPENSING CAP FOR AEROSOLS AND MOLD FOR MAKING SAME

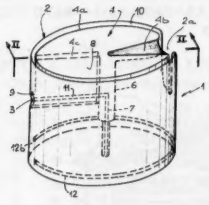
Bruno P. Morane, Paris, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France

Filed May 17, 1974, Ser. No. 471,046

Claims priority, application France, May 30, 1973, 73.19810

Int. Cl.² B65D *83/14*

U.S. Cl. 222—402.13 **5 Claims**



1. Dispensing cap for mounting on the upper end of a cylindrical pressurized container of the aerosol dispenser type equipped with a dispensing valve on said upper end, said cap comprising means for attaching it to said pressurized container and being made of a single piece of resilient plastic material comprising a body in the form of a cylindrical shell, the lateral wall of which is pierced by at least one dispensing orifice containing a nozzle entirely contained within the outer circumference of said wall, a cover substantially perpendicular to the axis of the cylindrical shell the edges of which are totally separated from said shell, a central hub provided with an axial duct aligned with said dispensing valve and a radial vane connecting said cover to the hub and extending to the cylindrical shell near the level of said dispensing orifice, said vane comprising a duct connected to the axial duct in the hub and terminating opposite the dispensing orifice in the lateral wall of the shell, and a narrow hinge lying on only one side of said duct and connecting said vane to said shell, said means for attaching the cap to the container being located on the internal surface of the lateral wall of the shell and consisting of an annular rib lying in a plane substantially perpendicular to the axis of the cylindrical shell.

3,918,616

DISPENSER NOZZLE COVER

Harry Goldsmith, 5140 N. 36th Court, Hollywood, Fla. 33021

Filed Apr. 30, 1974, Ser. No. 465,692

Int. Cl.² B65B *1/04*

U.S. Cl. 222—504 **2 Claims**

1. A beverage dispensing device comprising:

beverage dispensing means;

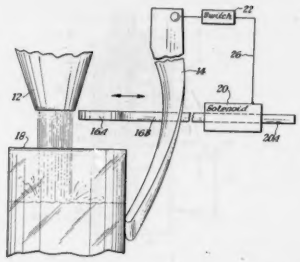
beverage valve actuating means connected to said beverage dispensing means;

beverage nozzle connected to said beverage dispensing means;

a lever arm connected to said valve dispensing means; nozzle cover;

linkage arm connected to said nozzle cover;

solenoid connected to said linkage arm and moveable from a first position to a second position;



means connecting said solenoid to said valve actuating means;

switching means connected to said solenoid circuit means whereby said lever actuating means signals said solenoid to move said linkage arm from a first position in which said nozzle cover is in contact and covering said nozzle opening to a second position away from and out of contact from said nozzle opening.

3,918,617

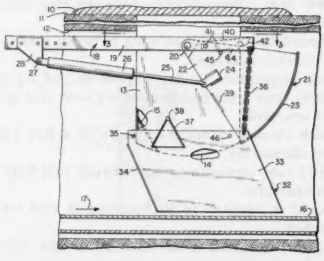
GATE FOR FLUENT MATERIAL

F. Browne Gregg, P.O. Box 1046, Leesburg, Fla. 32748

Filed Oct. 17, 1974, Ser. No. 515,724

Int. Cl.² B67D *3/00*

U.S. Cl. 222—536 **8 Claims**



1. Apparatus for selectively dispensing fluent material from a source of supply comprising tube means communicating with the source of supply and having a discharge opening, gate means associated with said tube means, said gate means having an imperforate wall located adjacent to said discharge opening, means for selectively operating said gate means for interrupting the flow of material and for controlling the flow of material through said discharge opening, chute means for directing the material passing through said discharge opening to a receiver, said chute means being swingably mounted adjacent to one side of the discharge opening of said tube means, first interengageable means carried by said gate means, second interengageable means carried by said chute means, and said first and second interengageable means being positioned so that said first interengageable means freely abuts said second interengageable means only when said gate means has moved to a substantially closed position in which said imperforate wall has substantially interrupted the flow of

material through said discharge opening and thereafter moves said chute means to an inoperative position.

3,918,618

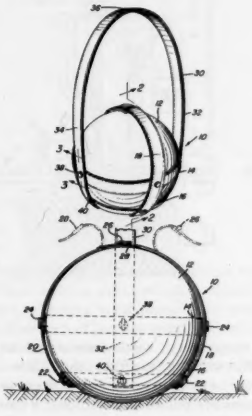
SHOT HOLDER

Octavio Castaneda, Newhall, Calif., assignor to Alicia C. Lopez; Jose G. Castaneda and Jose H. Adriano, all of Newhall, Calif., part interest to each

Filed July 25, 1974, Ser. No. 491,945

Int. Cl.² B65D 79/00

U.S. Cl. 224—45 L **6 Claims**



1. A holder for shot, said holder including a first strap member having opposite ends joined together to define a first horizontal generally circular ring, a second strap member having opposite ends joined together to define a second horizontal generally circular ring spaced below, vertically registered with and of inside and outside diameters appreciable smaller than the inside diameter of said first ring, a pair of flexible strap members having one pair of corresponding ends secured to diametrically opposite portions of said second ring and corresponding mid-portions secured to similar diametrically opposite portions of said first ring, the other pair of ends of said pair of strap members including securing means operative to releasably secure said other pair of ends together, and a third strap member having its terminal end portions anchored to diametrically opposite portions of said second ring disposed in a first vertical plane at generally right angles to a vertical plane containing the first mentioned diametrically opposite portions of said second ring and spaced opposite end portions spaced from said terminal ends secured to generally diametrically opposite portions of said first ring disposed in said first plane, the length of said third strap member between said spaced opposite end portions thereof being sufficient to elevate the midpoint of said third strap member above said first strap member a distance equal to at least three-quarters the diameter of said first ring, the inside diameters of and the spacing between the first and second rings being such that a spherical member snugly embraced by said first ring at a horizontal diameter of said spherical member will be snugly cradled by said second ring at a point spaced sufficiently above the lowest extremity of said spherical member to allow the lowest extremity of said spherical member to be placed upon the ground with said second ring spaced above the ground, said pair of strap members, when said other pair of ends are secured together, being operative to snugly embrace the upper portion of said spherical member and operative to support said second ring against downward displacement relative to said spherical member.

3,918,619

SAFETY DEVICE FOR SEAL FIXING APPARATUS

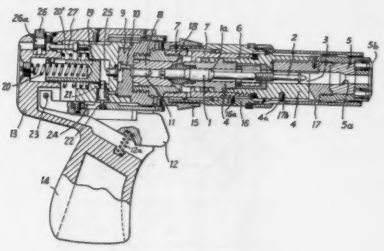
Pierre Termet, 16 Impasse Belloeuf, Lyon 3°, France

Filed Dec. 21, 1973, Ser. No. 427,309

Claims priority, application France, Dec. 26, 1972, 72.46212

Int. Cl.² B25C 1/14

U.S. Cl. 227—8 **7 Claims**



1. Cartridge-actuated fastening device including:

a slidable assembly comprising a barrel, a muzzle at one end of said barrel, a cartridge chamber at the other end of said barrel, and a breech-block and percussion means for exploding said cartridge located on the side of said chamber remote from said barrel,

a driving piston slidably mounted in said barrel for actuation by the gases produced by an explosion in said cartridge chamber to eject a fastener from said muzzle and,

a tubular casing having a handle near one end thereof, said assembly being mounted for axial sliding movement in said casing, spring means biassing said assembly so that said muzzle projects from the other end of said casing for a predetermined distance except when said spring means is compressed by pressing said muzzle against a material in which said fastener is to be driven,

latch means carried by said assembly and movable between a first position in which said latch means does and a second position in which it does not prevent operation of said percussion means,

a trigger mounted on said handle,

catch means carried by said trigger moving said latch means to said second position when said catch means is in engagement with said latch means and said trigger is actuated,

said latch means being spaced from a position in which it is engaged by said catch means by a distance no greater than said predetermined distance whenever said muzzle projects said predetermined distance from said tubular member.

3,918,620

DEVICE FOR FASTENING INTERMEDIARY PLATES ON A MOLD WALL

Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation-in-part of Ser. No. 267,702, June 29, 1972, Pat. No. 3,820,702. This application June 18, 1974, Ser. No. 480,484

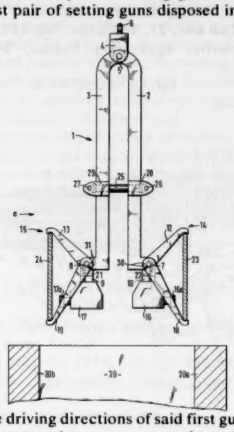
Claims priority, application Germany, July 7, 1971, 2133915

Int. Cl.² B25C 1/08

U.S. Cl. 227—9 **8 Claims**

1. Device for fastening intermediary plates to the walls of a mold includes a supporting frame, explosive charge-driven setting means mounted on said supporting frames for driving fastening members for anchoring the plates to the molds, and holders mounted on said supporting frame for holding the plates as they are moved into position for attachment, wherein the improvement comprises means for remotely positioning

said supporting frame within the mold, said setting means includes at least a first pair of setting guns with the driving axes of said first pair of setting guns disposed in parallel relationship and the driving directions of said first guns in said pair disposed 180° apart, and means connected to said setting guns for remotely firing all of said first guns located on said support frame at the same time.



3,918,621

EXPLOSIVE CHARGE-DRIVEN ANCHORING ELEMENT SETTING GUN

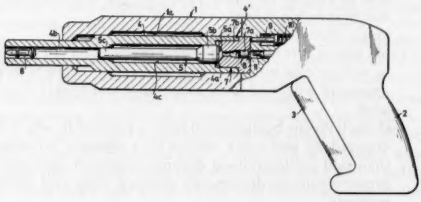
Peter Jochum, Meiningen, Austria, and Gottfried Benz, Nendeln, Liechtenstein, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed June 27, 1974, Ser. No. 483,717

Claims priority, application Germany, July 3, 1973, 2333887

Int. Cl.² B25C *1/14*

U.S. Cl. 227—10 **10 Claims**



1. In a setting gun using an explosive charge for driving anchoring elements into a solid receiving material, comprising a gun housing forming an axially extending passage providing a muzzle opening from one end of the housing, a barrel having a bore extending axially therethrough and mounted for axial displacement within the passage in said gun housing and having one end arranged to extend outwardly from the muzzle opening, a member mounted in said housing at the opposite end of said barrel from the muzzle opening, said member forming the chamber arranged to receive a cartridge and the chamber being open to the bore in said barrel, wherein the improvement comprises that said barrel is axially displaceable within said housing relative to said member, the end of said barrel adjacent to and facing toward said member having a shoulder positioned within the path of the explosive gases generated when a cartridge is fired within the chamber in said member so that the explosive gases exert a propulsive force against the end of said barrel for displacing it in the direction of the muzzle opening in said housing.

3,918,622

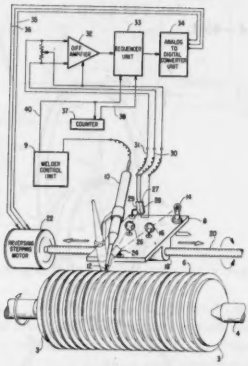
METAL BELLOWS WELDER

Richard R. Larsen, Daytona Beach, Fla., assignor to Bailey Meter Company, Wickliffe, Ohio

Filed Mar. 25, 1974, Ser. No. 454,323

Int. Cl.² B23K *1/00*

U.S. Cl. 228—8 **9 Claims**



1. In the formation of welded metal bellows, a machine for automatically welding together the outer circumferential edges of a pair of diaphrams having a rotatable arbor on which said diaphrams are mounted and rotate, a carriage, a welding torch mounted on said carriage and a reversing motor operatively connected to said carriage for positioning said carriage parallel to said arbor in forward and reverse directions, the combination comprising, a radiation source mounted on said carriage, a first optical system mounted on said carriage directing radiation from said source onto the weld bead after having been generated by the welding torch, a phototransducer generating an output signal corresponding to the radiation to which it is exposed mounted on said carriage, a second optical system mounted on said carriage exposing said phototransducer to the radiation from said source which is reflected by said weld bead and means under the control of said output signal operating said reversing motor whereby said carriage is positioned to maintain said torch in lateral alignment with said weld bead as the arbor rotates.

3,918,623

METHOD OF JOINING BY DIFFUSION WELDING A HOLLOW PART OF NONFERROUS METAL ONTO THE INNER SURFACE OF A HOLLOW PART OF FERROUS METAL

Juichi Ishiguro; Matsuho Miyasaka, and Nobumitsu Kitajima, all of Tokyo, Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1975, Ser. No. 564,341

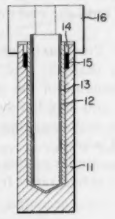
Claims priority, application Japan, May 7, 1974, 49-49803; July 5, 1974, 49-76437; Aug. 13, 1974, 49-92024

Int. Cl.² B23K *19/00*

U.S. Cl. 228—127 **3 Claims**

1. A method of joining by diffusion welding a hollow part of non-ferrous metal onto the inner surface of the bore of a hollow part of ferrous metal comprising the steps of inserting said hollow part of non-ferrous metal with a larger coefficient of thermal expansion than said hollow part of ferrous metal, into and in close contact with the bore of said hollow part of ferrous metal, then inserting a core of a material with a higher strength and a higher melting point than said hollow part of non-ferrous metal into and in close contact with the bore of

said hollow part of non-ferrous metal, and subsequently heating the composite part thus set to a diffusion welding temperature under a relatively low vacuum or in a non-oxidizing atmosphere under atmospheric pressure, characterized by: causing a low melting point metal in liquid phase having a lower melting point than said hollow part of ferrous metal, said hollow part of non-ferrous metal and said core to penetrate into a gap formed between said hollow part of ferrous metal and said hollow part of non-ferrous metal and a gap between said hollow part of non-ferrous metal and said core; then carrying out heating to a diffusion welding temperature to effect solid phase-liquid phase diffusion between said hollow part of ferrous metal and said hollow part of non-ferrous metal in solid phase and said low melting point metal in liquid phase; and, at the same time, effecting solid phase-solid phase diffusion between said hollow part of ferrous metal and said hollow part of non-ferrous metal in solid phase, by bringing said hollow part of ferrous metal and said hollow part of non-ferrous metal into contact with each other under pressure through the use of stress generated from the difference in thermal expansion between said hollow part of ferrous metal and said hollow part of non-ferrous metal while preventing said hollow part of non-ferrous metal from being deformed inward by means of said core.

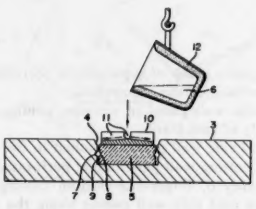


3,918,624

METHOD AND DEVICE FOR FIXING AN INSERT TO A MOLD STOOL

Toshimasa Kurihara, Narashino, Japan, assignor to Nippon Rutsubo Kabushiki Kaisha, Tokyo, Japan

Filed June 6, 1974, Ser. No. 477,046
Int. Cl.² B23K *31/02*
U.S. Cl. 228—112 **5 Claims**



1. A method of fixing an insert of refractory material to a stool of the top pouring type mold for casting steel ingots, comprising steps of:

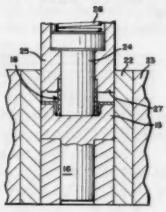
1. fitting the insert within a hollow provided on a surface substantially at the center of the stool so as to form a gap between walls of the hollow and the insert,
2. placing a weight on a top surface of the insert, the weight is provided with a metal flow, and
3. pouring a molten joint metal of cast iron or steel into the gap through the metal flow way and allowing it to solidify within the gap.

3,918,625

METHOD OF MAKING A DOUBLE EXTRUDED SEMICONDUCTOR JOINT

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Oct. 3, 1974, Ser. No. 511,939
Int. Cl.² B23K *31/02*
U.S. Cl. 228—136 **4 Claims**



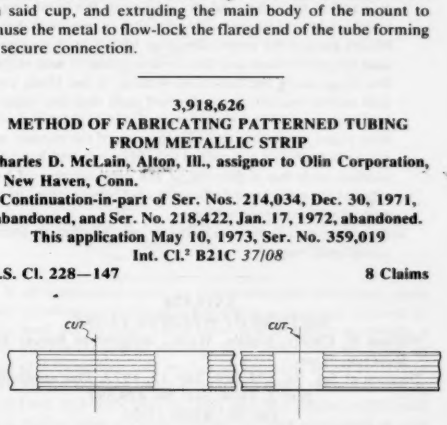
1. The method of forming a mount for a pressurized semiconductor device comprising silver brazing a steel ring to the upper surface of a copper billet, extruding the billet to form a downwardly opening collar on the ring, an open cup in the main body of the mount and a lower stem forming a steel tube with a flared lower end, mounting the flared end of said tube in said cup, and extruding the main body of the mount to cause the metal to flow-lock the flared end of the tube forming a secure connection.

3,918,626

METHOD OF FABRICATING PATTERNED TUBING FROM METALLIC STRIP

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. Nos. 214,034, Dec. 30, 1971, abandoned, and Ser. No. 218,422, Jan. 17, 1972, abandoned. This application May 10, 1973, Ser. No. 359,019
Int. Cl.² B21C *37/08*
U.S. Cl. 228—147 **8 Claims**



1. A method of continuously fabricating metallic tubing having formed patterns on the tubing wall comprising the steps of:

providing a strip of metal of predetermined width, indefinite length and side edges;

continuously advancing the strip;

continuously forming patterns on at least one surface of the strip during the course of advance;

intermittently interrupting the pattern forming step to break the continuity of the formed pattern and to create intervening smooth segments in said surface transverse to the strip length, each segment being a discontinuity in the pattern across the width of the strip;

continuously forming said strip into a tube by abutting the side edges to create a longitudinal, axially extending, continuous seam;

continuously welding said seam to create a fluid-tight seal; and thereafter transversely cutting the tubing within smooth segments thereof into discrete tube lengths.

3,918,627
METHOD OF MANUFACTURING A WELDED TYPE FRANCIS RUNNER

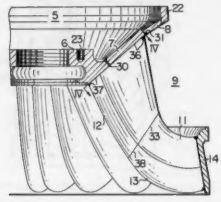
Michitada Kawano; Hideo Ito; Tadashi Jimbo; Hidenori Tonooka; Tetsuo Okuni, all of Hitachi, and Shunichi Fukasu, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 146,068, May 24, 1971, Pat. No. 3,797,965, which is a continuation-in-part of Ser. No. 854,220, Aug. 29, 1969, abandoned. This application Jan. 11, 1974, Ser. No. 432,519

Claims priority, application Japan, Sept. 2, 1968, 43-76236

Int. Cl.² B23K *31/02*

U.S. Cl. 228—178 **9 Claims**



1. A method of manufacturing a welded type Francis runner of the type comprising a crown ring and a band ring interconnected by a plurality of blades including the steps of:

preparing a plurality of runner sections each having a plurality of blades fixed at one end to a section of the crown ring and at the other end to a section of the band ring, at least one of said runner sections being so prepared that all blades except the respective edge blades at the edges of said runner sections are fixedly connected to said respective rings along the full cross-section of the blade ends, said runner section being formed such that the edges of said crown and band ring sections lie in at least one common plane extending through the axis of the runner, said edge blades being connected to said crown and band ring section such that a portion of the cross-section of both edge blade ends extends beyond said ring sections at one side of said common plane,

and joining said runner sections to one another to form a completed runner.

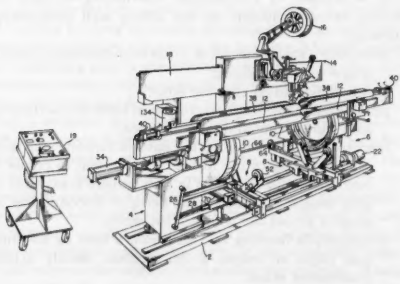
3,918,628
METHOD OF WELDING TANKS

William F. Clavey, Seattle, Wash., assignor to Paccar Inc., Bellevue, Wash.

Division of Ser. No. 271,399, July 13, 1972. This application Jan. 2, 1974, Ser. No. 429,597

Int. Cl.² B23K *37/04*

U.S. Cl. 228—213 **3 Claims**



1. A method of manufacturing a cylindrical tank comprising the steps of:

a. preforming a rectangular sheet into a shell having a configuration approximately the exterior shape of the completed tank;

b. placing the preformed shell in position upon supporting arm means;

c. clamping the shell in position upon the arm means with the opposing edges in juxtaposition;

d. welding the side seam of the shell;

e. placing a pair of end members in an opposed coaxial relationship at opposite ends of the shell, each of said end members being mounted within one of a set of coaxial elements adapted to engage the end member about its outer periphery;

f. advancing the set of coaxial elements and the end member toward the shell until the end member is wedged into the shell;

g. retracting all of the coaxial elements of the set having diameters larger than the end member while retaining those coaxial elements of the set which have diameters smaller than the end member such that the end members are retained in a shell-engaging position;

h. welding the end seams;

i. retracting the remainder of the set of coaxial elements;

j. removing the welded tank from the supporting arm means.

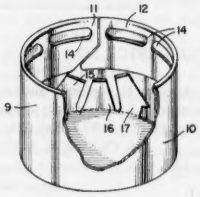
3,918,629
TUBULAR CARTON

Hampton E. Forbes, Jr., Wilmington, and Lawrence J. La-Freniere, Newark, both of Del., assignors to Westvaco Corporation, New York, N.Y.

Filed Jan. 13, 1974, Ser. No. 540,453

Int. Cl.² B65D *3/04*

U.S. Cl. 229—21 **7 Claims**



1. A one piece blank of substantially rectangular shape for forming a tubular carton, comprising:

a. a bottom wall panel of circular configuration located centrally of said blank;

b. a pair of side wall panels attached to two opposed sides of said bottom wall panel along perforated score lines;

c. a plurality of finger-like bottom closing flaps located between said side wall panels along the remaining opposed sides of said bottom wall panel and attached thereto along perforated lines;

d. a pair of tapered flaps foldably attached to said side wall panels along the edges thereof that are opposed from the attachment between said side wall panels and said circular bottom wall;

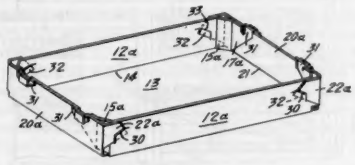
e. an access means in one of said side walls formed by a curved perforated line located adjacent the perforated line connecting said side wall to said bottom wall; and,

f. a plurality of longitudinal locking slots formed in each tapered flap and located adjacent the fold lines connecting the tapered flaps to the side wall panels.

3,918,630
TRAY WITH REINFORCED CORNER CONSTRUCTION AND BLANK THEREFOR

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 5, 1975, Ser. No. 547,289
Int. Cl.² B65D 5/26
U.S. Cl. 229—35 4 Claims



1. A substantially rectangular unitary paperboard carton blank for forming a tray having a hollow triangular pillar corner construction, said blank comprising:

a. a bottom panel,

b. two side panels hingedly connected to said bottom panel along a first pair of parallel score lines,

c. inner and outer corner flaps formed by corner slits extending diagonally inwardly from substantially the corners of said blank to said first pair of score lines and terminating in inwardly extending short end portion slits coincident with said first pair of score lines,

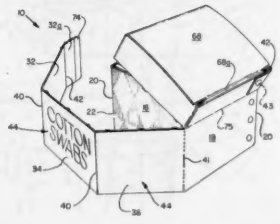
d. interior corner panels hingedly connected at opposite sides to said inner corner flaps and said side panels along fold lines extending substantially from the edge of the blank to said end portion slits, and

e. two end panels hingedly connected to said bottom panel along a second pair of parallel score lines extending perpendicular to and between said end portion slits and to said outer corner flaps along said first pair of score lines.

3,918,631
DECORATOR BOX

Robert A. Hackenberg, East Lyme, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Apr. 26, 1974, Ser. No. 464,448
Int. Cl.² B65D 5/54
U.S. Cl. 229—37 6 Claims



1. A box comprising:

A. a first series of aligned, hinged-together panels,

B. means for connecting the free side edges of the end panels in the first series together to form a tube,

C. a second series of aligned, hinged-together panels,

D. means for connecting the free side edge of one panel in the second series to a free side edge of an end panel in the first series, said second series of panels being wrapped at least partway around said tube formed by the first series of panels being wrapped at least partway around said tube formed by the first series of panels,

E. means for removably connecting the free side edge of the other end panel in the second series to a panel in the first series so that panels in the second series cover panels in the first series,

F. a decorative design applied to the outside of one or more panels in the first series underneath panels of the second series,

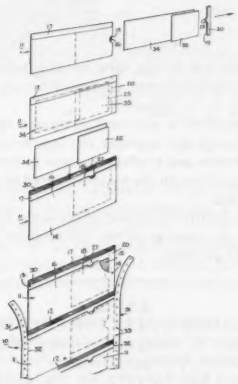
G. a tear line at the boundary between the first and second series of panels so that the second series of panels can be stripped away from the tube to reveal the decorative design on the panels in the first series, and

H. a second tear line extending along the second series of panels near the top edges thereof so that only the portion of the panels in the second series below the second tear line can be stripped away.

3,918,632
POUCHED CONTINUOUS ENVELOPE SYSTEM

Frank H. Neubauer, Mount Kisco, N.Y., assignor to Transkrit Corporation, Elmsford, N.Y.

Filed June 21, 1974, Ser. No. 481,752
Int. Cl.² B65D 27/10, 27/34, 27/08
U.S. Cl. 229—69 10 Claims



1. A continuous series of interconnected envelopes, each said envelope comprising a back ply, a front ply secured to said back ply to form a first open-ended pocket therewith, a flap portion on one of said plys for folding over the other of said plys to enclose said pocket, at least one insert ply within said pocket secured along at least two edges thereof to one of said front and back plys to form an insert pocket within said first pocket, said insert ply having an edge unsecured to said front and back plys, a tear-away portion along a common edge of each of at least said front and back plys and adjacent said unsecured edge of said insert pocket, each of said tear-away portions being defined by a line of weakening said tear-away portion being secured to each other for simultaneous removal from the remainder of said envelope to expose each said pocket for removal of the contents of the insert pocket from said side of said insert pocket corresponding to said unsecured edge and the corresponding side of said envelope.

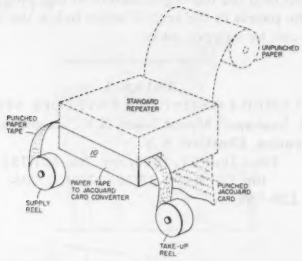
3,918,633
PAPER TAPE TO JACQUARD CARD REPEATER HEAD

Gottfried Maurer, Needham, Mass., assignor to Gessner A.G., Waedenswil, Switzerland

Filed Dec. 26, 1973, Ser. No. 427,827
Int. Cl.² G06K 1/18, 7/04; D03C 17/06; G06K 1/02
U.S. Cl. 234—79 13 Claims

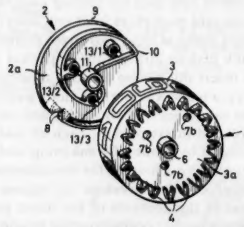
1. A Jacquard repeater head which comprises in combination:

a. means to introduce a roll of unpunched paper into the output side of the Jacquard repeater head;
b. a plurality of punches to punch a weave pattern on the unpunched paper;
c. a plurality of punch actuators adapted to drive the punches;
d. a striker to drive the actuators, the striker moving between a forward and a reverse position;
e. a plurality of first sensing needles engaged to the actuators, said needles arranged on an alternating offset relationship;



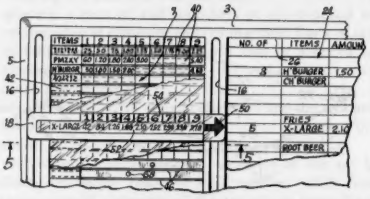
f. means secured to the first sensing needles to read a punched computer tape having uniformly aligned perforations;
g. means to move a punched computer tape of standard format through the repeater, the tape having weave information therein and to place the tape in information transfer relationship with the means secured to the first sensing needles; and
h. means to control the timed relationship the movement of the tape, the transfer of the information, and the actuation of the punches.

3,918,634
NUMBER WHEEL FOR COUNTERS
Helmuth Muller, St. Georgen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany
Filed Dec. 28, 1973, Ser. No. 429,217
Claims priority, application Germany, Jan. 16, 1973, 7301498
Int. Cl.² G06C *11/02*
U.S. Cl. 235—1 C **11 Claims**



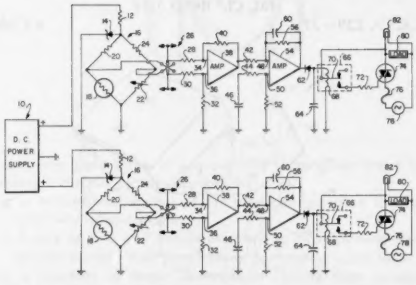
1. A number wheel for counters composed of a first circular portion provided with a center hub having an axis, and with a plurality of passages which are spaced from and asymmetrically distributed about said hub and which each have an axis paralleling the axis of said hub; and a discrete second circular portion having a center portion received in said hub and centering said second circular portion with reference to said first circular portion adjacent one axial end of the latter, and a plurality of projections each of which is frictionally received in one of said passages, said circular portions thus being prevented from relative axial and angular displacement and together constituting said number wheel.

3,918,635
MENU AND PRICE CALCULATOR
Jerry L. Gilomen, Chicago, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.
Filed Sept. 16, 1974, Ser. No. 506,422
Int. Cl.² G06C *3/00*
U.S. Cl. 235—89 R **15 Claims**



1. A menu and price calculator comprising a frame assembly having a top edge, a bottom edge and two side edges and an upper display surface, said upper display surface providing a first section for locating and supporting menu tickets and a second section adjacent to said first section for locating and supporting a plurality of price strips, a plurality of said menu tickets on said first section, each having a plurality of menu items listed thereon, a plurality of said price strips on said second section, each said price strip being in alignment with a said menu item on said menu tickets, each of said price strips indicating a unit price and multiples of said unit price in line with one of said menu items on said menu tickets, a price guide, and means for movably mounting said price guide on said frame assembly to traverse said plurality of price strips for visually aligning sequentially the price strips with the associated menu items.

3,918,636
DUAL TEMPERATURE CONTROLLER
Walter F. Dawson, Duluth, Minn., assignor to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.
Filed July 23, 1974, Ser. No. 491,098
Int. Cl.² H01H *47/32*; G05D *23/24*
U.S. Cl. 236—78 **1 Claim**



1. An apparatus for simultaneously effecting precision control of the temperature of a plurality of different bodies of water utilized in laboratory experiments, said apparatus comprising:
a plurality of Wheatstone bridge means each incorporating a thermistor in one arm thereof adapted to be disposed in a respective different body of water the temperature of which is to be monitored, adjustable resistance means incorporated in another arm of each respective bridge for balancing said respective bridge means at a given temperature, each said Wheatstone bridge means providing zero output voltage when the respective monitored tempera-

ture equals the given temperature and for providing a respective output voltage signal upon a deviation of said respective monitored temperature from said given respective balancing temperature, the polarity of each said output voltage signal being indicative of the direction of said respective temperature deviation;

a plurality of amplifier means for amplifying each said respective output voltage signal of each said Wheatstone bridge means;

a plurality of relay circuit means each including a diode rectifier respectively responsive to only one polarity of each said amplified output voltage signal, each said relay circuit means upon actuation generating a trigger signal;

a plurality of water temperature controlling load circuit means each including an energizing semiconductor triac switch means therein which assumes a conductive state in response to said respective trigger signal, each said load circuit means when energized effecting a thermal change in a respective body of water;

a plurality of manually operable double pole double throw switch means for selectively inverting the polarity of each said output voltage signal from each said Wheatstone bridge means, whereby said respective relay circuit means is selectively actuated and said respective load circuit means is energized only upon a selected one of an increase or decrease in the monitored temperature of said respective body of water; and

a single d.c. power supply means for all of said Wheatstone bridge means, said amplifier means, and said relay circuit means, said power supply means providing a positive d.c. voltage across each of said Wheatstone bridge means with respect to ground.

3,918,637

HEATER ASSEMBLY FOR MOTOR VEHICLE WITH WATER-COOLED COMBUSTION ENGINE

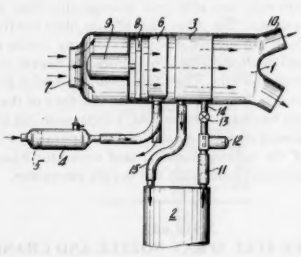
Siegfried Kofink, Zell, Germany, assignor to J. Eberspacher, Esslingen, Germany

Continuation-in-part of Ser. No. 201,352, Nov. 23, 1971, Pat. No. 3,777,975. This application July 30, 1973, Ser. No. 384,068

Claims priority, application Germany, June 26, 1972, 2231117. The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] B60H *1/02*

U.S. Cl. 237—12.3 C **4 Claims**



1. A heater assembly for a motor vehicle haivng a water-cooled combustion engine comprising, in combination, a housing defining therethrough a flow path for heater air, blower means for propelling heater air through said housing, burner means for providing heating gas, first heat exchange means located within said housing in the path of said heater air and having delivered thereto said heating gas from said burner means for conducting heat between said heating gas and said heater air, second heat exchange means located within said housing in the path of said heater air downstream of said first heat exchange means for conducting heat between said engine cooling water and said heater air, conduit means for conducting cooling water between said engine and said second heat exchange means, water pump means located within said conduit means and defining a portion thereof for circulating said engine cooling water between said engine and said second heat exchange means, said water pump means being essentially configured as a centrifugal pump comprising a generally cylindrical pump housing having a centrally located water inlet and a radially extending water outlet, and a drive wheel rotatably mounted within said pump housing, said pump housing being shaped to define between said water inlet and said water outlet a continuous portion of said conduit means free of internal constrictions extending thereacross.

3,918,638

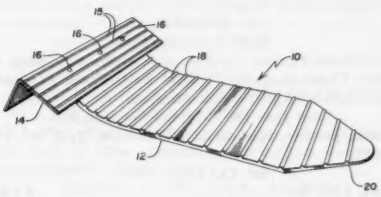
AUTO TRACK

Charles M. Nelson, 3029 Dupont Ave. South, Minneapolis, Minn. 55408

Filed Aug. 12, 1974, Ser. No. 496,555

Int. Cl.[2] E01B *23/00*

U.S. Cl. 238—14 **5 Claims**



1. Traction-enhancing apparatus for providing improved traction between a vehicle drive wheel and a wheel rut in a ground surface, comprising:

a belt, a first end of which may be inserted between said drive wheel and said ground surface, to provide additional traction between said wheel and said ground surface; and

wedge shaped means attached to a second end of said belt to provide both additional traction between said ground surface and said drive wheel and elevation of said drive wheel to lift it from the ground surface to a height which is substantially greater than the thickness of said belt when said belt is drawn under said drive wheel due to relative slippage between the ground surface side of said belt and said ground surface.

3,918,639

OIL ATOMIZER

Chester S. Binasik, Palo Alto, Calif., assignor to Coen Company, Inc., Burlingame, Calif.

Filed Sept. 19, 1974, Ser. No. 507,330

Int. Cl.[2] B05B *17/00;* **B44D** *1/08;* **B05B** *1/18, 1/14*

U.S. Cl. 239—1 **12 Claims**

11. A method for atomizing oil from an oil supply for burning the oil in a kiln or like apparatus, said method comprising the steps of:

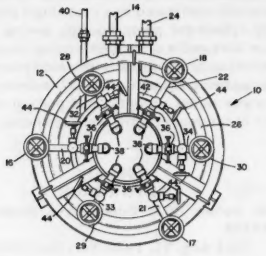
inserting a plurality of oil supply tubes through the walls of the kiln so that the leading ends of the supply tubes are disposed within the kiln and the trailing ends thereof project outside the kiln, said supply tubes each having a nozzle tip at the leading end thereof;

individually connecting the trailing end of each oil supply tube to the oil supply for operation of the kiln;

releasing the trailing end of a selected oil supply tube from the oil supply when the nozzle tip associated therewith requires cleaning;

withdrawing the selected oil supply tube and the associated nozzle tip from within the kiln while maintaining the operation of said kiln with the other oil supply tubes;

cleaning the removed nozzle tip;
reinserting the cleaned nozzle tip and the selected oil supply tube through the walls of the kiln; and



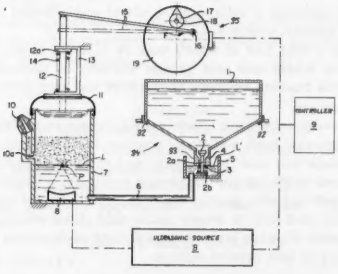
reconnecting the selected oil supply tube to the oil supply.

3,918,640

MIST GENERATOR

Pierre-Michel Piccino, Geneva, and Anthony Stephen Ringrose, Chene-Bougeries, both of Switzerland, assignors to Stern Freres SA, Geneva, Switzerland

Filed June 18, 1974, Ser. No. 480,397
Claims priority, application Switzerland, June 20, 1973, 8948/73
Int. Cl.² B05B *17/06*
U.S. Cl. 239—4 **8 Claims**



1. A mist generator comprising:
a generally closed vessel;
means for supplying a liquid to said vessel;
means for maintaining in said vessel a predetermined liquid level, said vessel being formed above said level with a throughgoing outwardly open aperture and having at least one deflectible wall;
means including a transducer below said level in said vessel for generating and focusing ultrasonic vibration on a location in said liquid at substantially said level to generate a homogeneous body of mist above said level, said aperture communicating with said vessel by a passage opening within said body of mist; and
means for deflecting said wall inwardly into said vessel to reduce the volume enclosed by said wall at most by the volume of said body for expelling a cloud of mist above said liquid out of said vessel through said aperture.

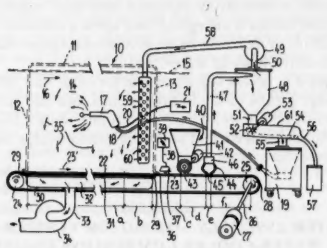
7. A method of generating mist comprising the steps of:
filling a generally closed chamber having a predetermined volume with a liquid to a predetermined level;
focusing ultrasonic vibration on said liquid at said level to form in said chamber above said level a body of mist;
inwardly deflecting a wall of said chamber to force said body of mist out a hole in said chamber above said level; and
maintaining said level at a predetermined height in said chamber, said ultrasonic vibration being focused on said level for a time sufficient to form a mist body having a predetermined volume, and said wall being deflected inwardly to an extent that reduces said predetermined volume of said chamber by a volume at most equal to the volume of said mist body.

3,918,641

ELECTROSTATIC POWDER COATING INSTALLATION

Ernst Lehmann, and Robert Prinzing, both of St. Gall, Switzerland, assignors to Gema AG Apparatebau, St. Gallen, Switzerland

Filed Dec. 20, 1974, Ser. No. 534,675
Claims priority, application Switzerland, Nov. 14, 1974, 15177/74
Int. Cl.² B05B *5/02*
U.S. Cl. 239—15 **16 Claims**



1. An electrostatic powder coating installation comprising a cabin, a supply container, means operatively coupled with the supply container for delivering electrostatically charged powder into the interior of the cabin, said cabin being provided with an internal compartment, a filter movable in a predetermined direction of travel through the cabin, said filter having opposed faces, one face of said filter bounding a part of the internal compartment of the cabin, a suction device having a suction side and effective through the filter at said internal compartment, the other face of said filter confronting the suction side of the suction device, a cleaning device operatively associated with the filter for removing excess powder which has deposited on the filter, said cleaning device possessing a suction nozzle directed towards the one face of the filter, a suction blower having a suction side, a separator, the suction nozzle being connected by means of the separator with the suction side of the suction blower, said separator having an outlet flow communicating with the supply container.

3,918,642

ADJUSTABLE FULL SPRAY NOZZLE AND CHANGES REQUIRED ON IMPULSE SPRINKLERS TO ACCOMMODATE USE OF NOZZLE

Carl L. Best, 4141 NW. 39 Ave., Fort Lauderdale, Fla. 33309

Filed Sept. 7, 1973, Ser. No. 395,005
Int. Cl.² B05B *3/02*
U.S. Cl. 239—230 **4 Claims**

1. In an impulse type sprinkler having a main body capable of rotation about a vertical axis,
an upstanding pipe stem with an enlarged head at its lower end, said pipe stem being threaded into the main body,
a standard pipe threaded member surrounding said pipe stem for fluidly connecting said main body to a source of water under pressure,

a washer between said enlarged head and the bottom part of said threaded member

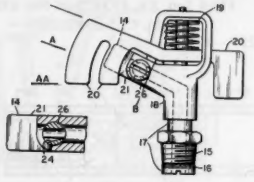
a swing member journaled on said main body for rotation about said vertical axis and having a hammer to receive the impact of water,

a spring interconnecting said swing member and the main body,

said body having a portion angled outwardly with respect to the vertical axis,

an outlet on said portion,

said swing member aligned with said outlet whereby water issuing from said outlet will impinge upon said swing



member causing said swing member to move and hit some part of the main body

wherein the improvement comprises an adjustable nozzle means inserted perpendicularly into said outlet for selectively varying with respect to the horizontal axis, the elevation of the stream of water issuing from said nozzle means, means on said hammer to receive the stream of water issuing from said nozzle means regardless of its elevation, and

wherein the outwardly angled portion has a protrusion extending past said outlet and is adapted to receive the impact of said swing member.

3,918,643

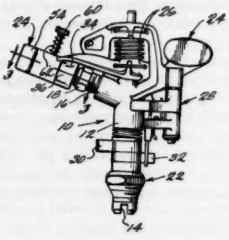
IMPACT AND REACTANT STEP-BY-STEP ROTARY SPRINKLER HEAD

William R. Malcolm, Sanger, Calif., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Nov. 1, 1974, Ser. No. 520,206

Int. Cl.² B05B *3/16, 1/26*

U.S. Cl. 239—230 **7 Claims**



1. A step-by-step rotary sprinkler head comprising a sprinkler body having an inlet and an outlet having a flow axis, means for mounting said sprinkler body for rotation about a vertical axis with said inlet in communication with a source of water under pressure and with the flow axis of said outlet extending upwardly and outwardly, an impulse arm mounted on said sprinkler body for oscillatory movement about a vertical axis toward and away from a limiting position of abutment with said sprinkler body, means for biasing said impulse arm into said limiting position so as to impart an impact force to said sprinkler body in one direction, said impulse arm having a first reactant portion disposed in a position thereon radially outwardly of said outlet and within the flow axis thereof when said impulse arm is disposed in said limiting position, said first reactant portion having a first reactant surface shaped to deflect water issuing from said outlet in an opposite direction and establish a reactant force on the impulse arm acting to move the same in said one direction toward said limiting position, said sprinkler body having a reactant element thereon disposed radially outwardly of said first reactant portion in a position spaced in said opposite direction from the flow axis of said outlet so as to receive the water deflected by said first reactant surface when said impulse arm is disposed in said limiting position and to permit unobstructed flow of water issuing from said outlet when said impulse arm is spaced from said limiting position, said reactant element having a second reactant surface thereon shaped to deflect the water impinging thereon further in said opposite direction and establish a reactant force on said sprinkler body acting in said one direction, said impulse arm having a second reactant surface portion disposed in a position to receive the water issuing from said second reactant surface, said second reactant portion having a third reactant surface thereon shaped to deflect the water laterally in said one direction so that it issues therefrom in a direction generally parallel with the flow axis of said outlet and establishes a reactant force acting on said impulse arm to move the same in said opposite direction.

3,918,644

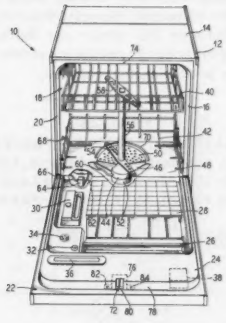
INVERTIBLE DUAL ACTION SPRAY ARM FOR DISHWASHER

Clark I. Platt, Benton Harbor, and James I. Czech, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 5, 1974, Ser. No. 520,986

Int. Cl.² B05B *3/00*

U.S. Cl. 239—243 **11 Claims**



1. In a dishwasher having a washing chamber for containing items to be washed, an apertured conduit within the washing chamber, and pump means for supplying washing liquid under pressure through said conduit; a spray device for mounting within the washing chamber comprising:

means forming fludically-separate substantially-symmetrical first and second chambers;

first nozzle means a fluid communication with the first chamber for directing spray to the items to be washed;

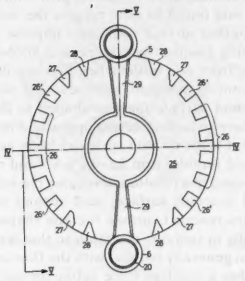
second nozzle means in fluid communication with the second chamber for directing spray to the items to be washed; and

means for rotatably mounting the spray device in a primary position on the conduit with the first chamber of said spray device covering the apertures in said conduit for fluid communication therebetween, and an inverted position on said conduit with the second chamber of said spray device covering said apertures in said conduit for fluid communication therebetween.

3,918,645
SPRINKLER VALVES

Hans Mohler, Laugneri, Switzerland, assignor to Jomos-Sprinkler-Material AG, Weggis, Switzerland

Filed July 10, 1974, Ser. No. 487,269
Int. Cl.² B05B *01/26*
U.S. Cl. 239—498 **10 Claims**

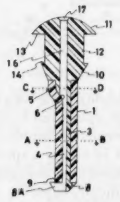


1. In combination, a water sprinkler valve comprising means for producing a water jet, a carrier for the water jet producing means, a baffle plate having a periphery, the baffle plate having a surface spaced from the means for producing the water jet and positioned to cause the water to flow radially from the center of the baffle plate towards the periphery thereof, the baffle plate including at least two column-shaped support elements extending from the periphery thereof and supporting the baffle plate on the carrier, and teeth spaced about the periphery, at least the teeth immediately adjacent the support elements having deflecting surfaces arranged to deflect the radially outwardly flowing water in intersecting paths beyond the respective support elements, and pre-tensioned means between the carrier and the baffle plate for normally closing the water jet producing means and for releasing the same for producing the water jet.

3,918,646
IRRIGATION SYSTEMS BY TRICKLING

Jaime Leal-Diaz, and Javier Rangel-Garza, both of Escobedo Sur 733, Suite 201, Monterrey, Nuevo Leon, Mexico

Filed Sept. 6, 1974, Ser. No. 503,910
Int. Cl.² B05B *15/00*
U.S. Cl. 239—271 **6 Claims**

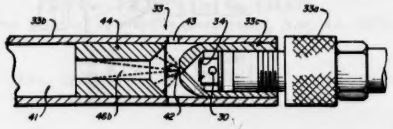


1. A two piece water emitter adapted for mounting primarily inside a hollow conduction line with a confining wall with an outlet port member positioned near the exterior surface of the conduction line for discharge of water, and an entrance port positioned inside said line, comprising in combination, a stiff male member having said outlet as the head thereof for discharging fluid, a fitting for engaging said wall of said conduction line to hold said member in place therein with said head substantially flush with said confining wall and with a stiff stem portion defining a water conveyance duct therethrough for extending inside said hollow line to convey fluids through said confining wall, and an elastic generally cylindrical female section for fitting snugly around a portion of said stem to form a wall portion of said fluid conveying duct therein and extend substantially radially into said line and wherein fluid entrance and exit ports extend from opposite ends of said female member.

3,918,647
FOAM GENERATING APPARATUS

Richard A. Lamz, Melrose Park, and Barry Schneider, Crystal Lake, both of Ill., assignors to Chemtrust Industries Corporation, Franklin Park, Ill.

Filed Jan. 14, 1974, Ser. No. 432,949
Int. Cl.² B05B *7/00*
U.S. Cl. 239—428.5 **9 Claims**



1. A foam generating nozzle assembly comprising: in combination: an inlet section through which a liquid can pass and including orifice-forming means through which liquid passes; and a foam-producing section having an inlet end which receives a stream issuing from said orifice-forming means, a pressure reducing passageway with a low pressure portion communicating with said inlet end, air inlet port-forming means in communication between the exterior of the nozzle assembly and said pressure reducing passageway, said pressure reducing passageway when said stream passes therethrough causing the aspiration of air through said air inlet port-forming means and the mixing thereof into the liquid stream passing through the nozzle assembly, the shape and dimension of said pressure reducing passageway being such that foam-producing turbulence is produced in the aerated stream passing therethrough, and a foam thickness enhancing expansion chamber beyond said pressure reducing passageway which expansion chamber has a width at least about two times that of the low pressure portion of said pressure reducing passageway, the length to diameter ratio of said expansion chamber being in the range from about 7 to 20 so that the foamed material issuing from the end of said pressure reducing passageway is thickened substantially without substantially reducing the velocity thereof.

8. An adjustable foam-generating nozzle assembly comprising, in combination: an inlet section through which an unaerated liquid can pass and including an adjustable portion with manually adjustable means comprising a rotatable member, a foam-producing section carried by said rotatable member, said foam-producing section having an inlet end which receives the entire variably shaped stream issuing from said orifice-forming means, a pressure reducing passageway communicating with said inlet end, air inlet port-forming means in communication between the exterior of the nozzle assembly and said pressure reducing passageway, said pressure reducing passageway when said stream passes therethrough causing the aspiration of air through said air inlet port-forming means and the mixing thereof into the liquid stream passing through the nozzle assembly, the shape and dimension of said pressure reducing passageway being such that foam-producing turbulence is produced in the aerated stream passing therethrough to a degree which varies with the shape of the stream issuing from said orifice-forming means of the nozzle assembly, and an expansion chamber beyond said pressure reducing passageway which expansion chamber has a width much greater than that of the forward end portion of said pressure-reducing passageway, and the length of said expansion chamber being sufficiently great that the foamed material issuing from the

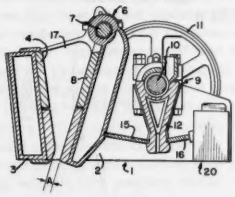
end of said pressure reducing passageway is thickened substantially without substantially reducing the velocity thereof.

3,918,648

RELIEF MECHANISM FOR JAW CRUSHER

James Anthony, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed May 31, 1974, Ser. No. 475,002
Int. Cl.² B02C *1/04*
U.S. Cl. 241—32 **6 Claims**



1. For use in a jaw crusher including a frame, a fixed jaw mounted on said frame and a movable jaw mounted on said frame and means for moving said movable jaw alternately toward and away from said fixed jaw at a predetermined operating speed to thereby crush material between said fixed and movable jaws, apparatus for relieving excessive loads applied to said movable jaw comprising:

piston-cylinder means adapted to contain a volume of fluid and including a piston means mounted in a cylinder means;

said piston means operatively connected to the movable jaw of the jaw crusher and movable relative to the cylinder means and said cylinder means being fixed to said frame;

means operatively connected to said piston-cylinder means for exhausting fluid in said piston-cylinder means when the fluid pressure in said piston-cylinder means exceeds a predetermined maximum whereby when an excessive load is applied to the movable jaw, it is transferred to the fluid through the piston means;

said means for exhausting fluid including valve means for exhausting fluid from the piston-cylinder means at a flow rate which is at least equal to that required to permit said piston means to move freely relative to said cylinder means at the predetermined operating speed of the movable jaw when an excessive load is applied to the movable jaw;

pressure sensor means operatively connected to said valve means and flow connected to said piston-cylinder means for sensing the pressure of the fluid in said piston cylinder means and opening said valve means when the pressure of said fluid exceeds the predetermined maximum;

said pressure sensor means adapted to be connected to the means for moving said movable jaw for stopping the means for moving the movable jaw when the pressure of said fluid exceeds a predetermined maximum.

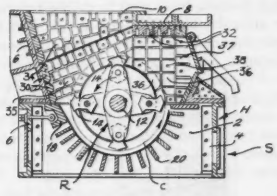
3,918,649

LINERS FOR SHREDDING MACHINES

Donald G. Miller, Glendale, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed Apr. 7, 1974, Ser. No. 456,464
Int. Cl.² B02C *13/09*
U.S. Cl. 241—189 R **5 Claims**

1. In a reducing machine including a housing having an inlet, a grate in the housing, and a rotor which revolves in the housing above the grate and about a horizontal axes so as to engage material introduced into the housing through the inlet to reduce that material to fragments of smaller size which will pass through the grate, the improvement comprising a liner attached firmly to the housing above the grate and outwardly from the rotor such that it is between the housing and rotor so as to protect the housing from fragments propelled by the rotor, the liner being formed from steel which tends to flow upon being subjected to impacts and having a working surface presented toward the rotor, the liner further having a plurality of grooves which open out of the working surface, the grooves having curved inner ends and further being tapered outwardly



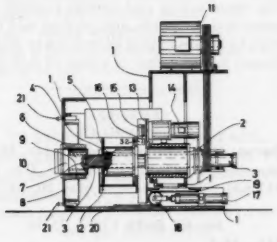
from their curved inner ends so that the grooves have their greatest width at the working surface, the depth of each groove being between about 25 and 50 percent of the thickness of the liner at the groove, and the area bordered by two or more grooves being between about 50 in.² and 400 in.², whereby the metal of the liner will flow into the grooves as it undergoes plastic deformation and will not create excessive stresses or substantially deform the liner as a whole.

3,918,650

APPARATUS FOR WINDING WIRE ONTO A BOBBIN

Noel Kemel, Harelbeke, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed June 25, 1974, Ser. No. 482,872
Int. Cl.² B65H *54/00*
U.S. Cl. 242—25 R **9 Claims**



1. Apparatus for winding wire onto a bobbin having a cylindrical hollow core, which apparatus comprises:

a. a fixed frame defining a chamber for the bobbin, said chamber being for its greatest part surrounded by said frame;

b. a door, pivotally mounted in said fixed frame, adapted to give passage to the bobbin into said chamber when open, and to be closed in a vertical position;

c. a substantially horizontal shaft rotatably mounted in said fixed frame extending through said chamber and having one end engaged in said door when closed; and

d. a centre mounted in said door, said centre being in and out of engagement with said end of said shaft when said door is in a closed and open position, respectively; the mutual positions of the door and the shaft being such that a bobbin can be introduced in or withdrawn from said chamber with its cylindrical hollow core in alignment with said shaft.

3,918,651

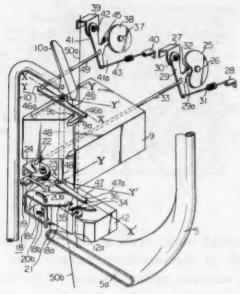
METHOD AND DEVICE FOR READYING OF YARN ENDS, PARTICULARLY IN YARN-WINDING MACHINES

Hiroshi Uchida, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed July 2, 1973, Ser. No. 375,374

Int. Cl.² B65H *54/22, 63/00*

U.S. Cl. 242—35.6 R **6 Claims**



1. In a method for readying yarn ends in a yarn winding machine when a piecing operation is required, wherein yarn ends are firstly retrieved from a yarn package and from a supply cop, said retrieved yarn ends are secondly pieced together by a knotter mounted on each winding unit of said winding machine, an improvement comprising inspecting yarn defects such as a doubled or tripled yarn involved in said retrieved yarn ends taken from said package and supply cop respectively by means of a slub catcher utilized for inspecting yarn defects during normal winding operation, removing yarn portions involving a yarn defect from either of said retrieved yarn ends by said slub catcher when said slub catcher detects a yarn defect prior to said yarn piecing operation so that said yarn piecing operation by said knotter is made ineffective to piece together said yarn ends, and, piecing said retrieved yarn ends together by means of said knotter when said slub catcher does not detect a yarn defect in either of said yarn ends.

3,918,652

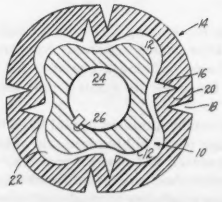
CORE CHUCKS

Kirk W. Bassett, 9 Knollwood Road, Paxton, Mass. 01612

Continuation-in-part of Ser. No. 185,714, Oct. 1, 1971, Pat. No. 3,811,632. This application May 20, 1974, Ser. No. 471,301

Int. Cl. B65h *17/02, 75/30*

U.S. Cl. 242—46.4 **5 Claims**



1. A core chuck assembly having an axis adapted for coaxial coupling to a web roll supported on a core comprising a relatively rigid actuator formed with a plurality of radially extending equally spaced lobes and a flexible sleeve of elastomeric material loosely surrounding the actuator, the sleeve including a plurality of circumferentially compressible zones angularly interposed about the axis generally centrally between the lobes on the actuator, each zone having at least two generally radial slots defining the zone.

3,918,653

WINCH ASSEMBLY

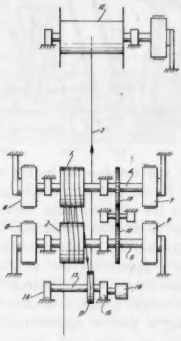
Horst Harms, and Hans-Jürgen Kunsch, both of Bremerhaven, Germany, assignors to Aktien-Gesellschaft "Weser", Bremen, Germany

Filed Feb. 14, 1974, Ser. No. 442,573

Claims priority, application Germany, Feb. 17, 1973, 2307978

Int. Cl.² B65H *75/00*

U.S. Cl. 242—54 R **5 Claims**



1. In a winch assembly, a combination comprising a storage drum; friction drums spaced from said storage drum; an elongated flexible element stored on said storage drum and extending in part to said friction drums to be paid out and taken up by the same; and regulating means, including a roller about which said flexible element is trained intermediate said storage and friction drums, a shaft freely turnably mounting said roller, and bearing means mounting said shaft for turning displacement about a turning axis which is eccentric with reference to the longitudinal center line of said shaft.

3,918,654

AUTOMATIC WINDING APPARATUS FOR A STRIP OF MATERIAL

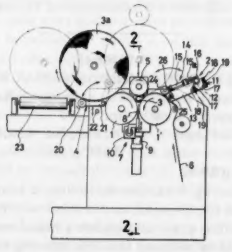
Hideo Okubo, and Michio Ishikawa, both of Urawa, Japan, assignors to Fuji Shiko Kabushiki Kaisha, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,782

Claims priority, application Japan, July 21, 1973, 48-80810; Sept. 12, 1973, 48-102621; Sept. 18, 1973, 48-108404; Feb. 12, 1974, 49-16261; Feb. 11, 1974, 49-20401

Int. Cl.² B65H *19/20, 17/08*

U.S. Cl. 242—56 R **16 Claims**



1. An automatic winding apparatus for a strip of material comprising a pair of driven under rollers adapted for support-

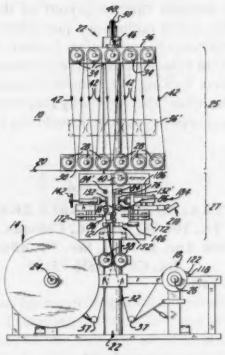
ing and driving a bobbin thereon, said under rollers being in spaced parallel arrangement and defining a gap therebetween, feed means for feeding a strip of material from one side of said pair of under rollers onto the bobbin supported thereon and on which the strip of material is wound, means for removing a full bobbin from said under rollers after said strip has been wound on said bobbin to a predetermined extent, receiver means disposed on the side of the pair of under rollers opposite said feed means for receiving the full bobbin from said under rollers after removal therefrom and for continuing the drive of the full bobbin, said strip of material being fed from the feed means over the under rollers and the gap therebetween to the still driven full bobbin, means for supplying an empty bobbin on the now vacant under rollers above said strip, means for rendering said strip of material adhesive in two spaced regions on opposite sides of said empty bobbin, and cutter means for projecting in said gap to cut said strip between said adhesive regions such that the end of the strip is wound on said full bobbin and is adhesively secured thereto while the beginning of the strip is adhesively secured to the empty bobbin, said cutter means comprising a frame mounted beneath said under rollers, and a cutting tool carried by said frame and being raisable to a position within said gap to cut the strip passing on said under rollers.

3,918,655

WEB-SPLICING APPARATUS

Rudolf E. Hillner, Colts Neck; David Strouse, Jr., Parlin, and Lou Hoch, Nutley, all of N.J., assignors to Champion-Edison, Inc., Edison, N.J.

Filed Nov. 8, 1973, Ser. No. 413,793
Int. Cl.² B65H *19/18*
U.S. Cl. 242—58.1 **2 Claims**



1. Apparatus for automatically splicing the beginning of one roll of paper or the like onto the approximate end of a second roll of paper or the like without discontinuing the flow of paper to a utilizing device; said apparatus comprising:

a support stand;

first support shaft means carried by said support stand for carrying said one roll of paper;

second support shaft means carried by said support stand for carrying said second roll of paper;

festooner means carried by said support stand for establishing an elongated path of travel for paper of said second roll moving through said apparatus and for allowing said utilizing device to "feed" upon the paper carried by said festooner means when the second roll of paper has stopped rotating;

first braking means for stopping rotation of said second roll when a preselected amount of paper remains on said roll: clamping, severing and splicing means responsive to the halt of said second roll for clamping the paper of said second roll at a first predetermined location, severing the paper of said second roll at a second predetermined location, below said first predetermined location, and for joining the beginning of said one roll to the severed end of said second roll;

releasing means for resetting said clamping, severing and splicing means after the beginning of said one roll has been joined to the severed end of said second roll;

first drive means for rotating said first support shaft means;

control means for energizing said first drive means for a predetermined length of time, said control means being activated after the operation of said releasing means;

sensing means responsive to the tension in said paper of said one roll for generating control signals in proportion to said tension in said paper of said one roll;

second braking means for stopping the rotation of said first roll when a preselected amount of paper remains thereon and for cooperating with said first support shaft means and responsive to said control signals for controlling the speed of rotation of said first support shaft means;

wherein said festooner means comprises:

a first set of rollers secured to said support stand in freely rotatable relation therewith;

a second set of freely rotatable rollers, said second set of rollers being displaceable relative to said first set of rollers;

said paper of said second roll alternatively passing over rollers of said first and second sets to establish said elongated path; and further including

operating means for maintaining said second set of rollers at a predetermined distance from said first set of rollers when said second roll of paper is rotating, said operating means including means for permitting said second set of rollers to approach said first set of rollers when said second roll of paper has stopped rotating; wherein said apparatus further includes:

first switch means responsive to said first set of rollers traveling a first predetermined distance for initiating operation of said clamping, severing and splicing means;

second switch means responsive to said first set of rollers traveling a second predetermined distance for initiating operation of said releasing means; and

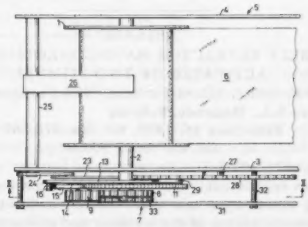
third switch means responsive to said first set of rollers traveling a third predetermined distance for initiating operation of said control means.

3,918,656

DEVICE FOR FEEDING A TAPE

Goran Ingemar Lundström, Johanneshov, and Oswald Karl Gustav Andersson, Bandhagen, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed June 19, 1974, Ser. No. 481,116
Int. Cl.² B65H *17/02*
U.S. Cl. 242—67.1 R **4 Claims**



1. A device for feeding a tape, especially an ink ribbon, in which device the tape is arranged to be wound up on a spool supported on a shaft which is arranged to be turned intermit-

tently, said shaft supporting a locking member and a stage member which is turnable in relation to the shaft and the locking member, said locking member and stage member having mutually interacting locking means cooperating to drive the locking member when the stage member is turned in one direction and cooperating to disengage the stage member and the locking member from each other when the stage member is turned in the opposite direction, said stage member being hingedly connected to a mechanism for sensing the amount of tape wound up on the spool and being coupled to said mechanism so as to be set in an angular position corresponding to the amount of tape wound up on the spool, a drive means operating to drive said stage member from a starting position defined by the amount of tape on the spool to an end position, the stage member cooperating during this movement with the locking member to drive the locking member, characterized in that the locking member is rotatable in relation to the shaft and is coupled to the shaft via a toothed wheel gearing so as to turn the shaft when driven by the stage member.

3,918,657

TAPE REEL

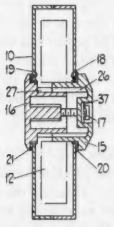
Michael John Hawker, Tettenhall, and Dennis Frederick Poole, Solihull, both of England, assignors to Rabone Chesterman Limited, Birmingham, England

Filed July 11, 1974, Ser. No. 487,641

Claims priority, application United Kingdom, July 20, 1973, 34696/73

Int. Cl.² B65H *75/16*; G01B *3/10*

U.S. Cl. 242—84.8 **3 Claims**



1. A tape reel comprising a casing, a hub having a post thereon journalled in the casing, said hub being of variable width and formed of two axially telescopically interengageable components, fastening means securing said two components together to fit the casing width, a tape measure contained within the casing having an inner end secured to the post on the hub, said components having respective telescopically engaged elements of the post on which the tape measure end is secured, a handle on the hub to rotate it to reel in the tape measure, and means on said two components for preventing relative rotation between them.

3,918,658

SEAT BELT RETRACTOR HAVING INERTIAL DEVICE ACTIVATED BY TWO STIMULI

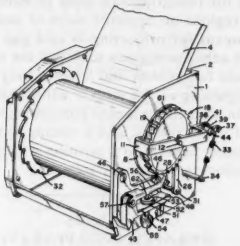
Herbert R. Beller, Mount Clemens, Mich., assignor to N. V. Klippan S.A., Haasrode, Belgium

Filed June 15, 1973, Ser. No. 370,567

Int. Cl.² A62B *35/02*

U.S. Cl. 242—107.4 **16 Claims**

16. In a vehicle safety belt retractor having a shaft and belt webbing wound upon said shaft, wherein said retractor normally permits payout of the webbing and prevents payout of the webbing under emergency conditions, the improvement comprising: a webbing-sensitive locking mechanism mounted on the retractor, responsive to withdrawal of the webbing at a pre-selected high rate of acceleration, and an independently mounted vehicle sensitive sensor which, in response to rapid acceleration or deceleration of the vehicle to which the retractor is attached, places said webbing sensitive locking mechanism in condition for actuation into locking engagement to prevent any further extension of the webbing; said webbing sensitive locking mechanism including: a movable means, means mounting said movable means on said retractor for movement between a stationary position and an actuated position, means biasing said movable means to its normally stationary position; an inertia wheel, means for rotatably mounting said inertia wheel on said movable means; gear means coupled to said shaft and to said movable means, said movable means responding to motion of said gear means, whereby acceleration in the payout of said webbing causes



acceleration in rotation of said shaft and induces movement of the gear means as a result of said coupling between said gear means and said shaft, causing movement of the movable means to its actuated position in opposition to its bias, as a result of said coupling between said gear means and said movable means, said movable means actuating said locking mechanism to prevent further payout of the webbing; said vehicle sensitive sensor including a pendulum means for locking said inertia wheel, preventing further rotation of said inertia wheel; said vehicle sensitive sensor thereby placing said webbing sensitive locking mechanism in condition for actuation, said inertia wheel thereby being responsive to two different stimuli to prevent payout of the webbing under emergency conditions.

3,918,659

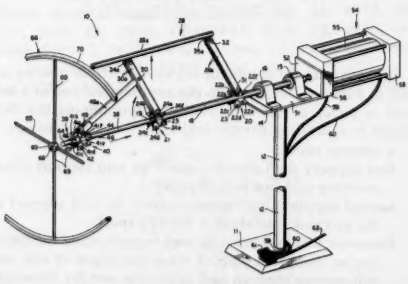
FLUID OPERATED EXPANDABLE SKEIN HOLDER

John Padgett, Jr., 102 W. May St., Calhoun, Ga. 30701

Filed Apr. 1, 1974, Ser. No. 456,543

Int. Cl.² B65H *75/24*

U.S. Cl. 242—110.1 **6 Claims**



1. A yarn skein holder comprising support means, a tubular shaft mounted on said support means, an actuating rod positioned in the opening of said tubular shaft with its ends extending beyond the ends of said tubular shaft and movable telescopically through said tubular shaft, collar means connected to said tubular shaft and to said actuating rod, a plurality of skein support bars oriented approximately parallel to each

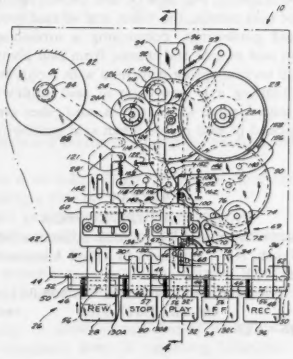
other and circumferentially and radially spaced about said tubular shaft, a plurality of pivotal support arms, each pivotal support arm connected at one of its ends to the collar means of said tubular shaft and at the other of its ends to a skein support bar, a plurality of connecting links with each connecting link connected at one of its ends to the collar means of said actuating rod and at the other of its ends to a pivotal support arm, a fluid actuated ram assembly including a cylinder mounted on said support means and a ramrod distendable from said cylinder and connected to one end of said actuating rod, and a balloon ring removably mounted on the other end of said actuating rod, whereby fluid pressure is communicated with said ram cylinder to move the actuating rod telescopically through the tubular shaft to cause the skein support bars to move radially inwardly or outwardly with respect to the tubular shaft.

3,918,660

BRAKE MECHANISM FOR MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Shizuo Takashino, Ichikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,064
Claims priority, application Japan, Aug. 9, 1973, 48-89473
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—204 **11 Claims**



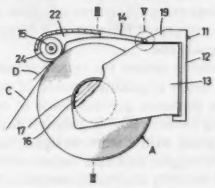
1. An apparatus for recording and/or reproducing signals on a magnetic tape extending between first and second tape reels to which the ends of the tape are secured and on which the tape may be wound; said apparatus including first and second rotatable reel support members for rotational coupling with the first and second tape reels respectively; drive means having at least one main drive wheel; drive control means for selectively activating and deactivating said drive means; transmission means responsive to said control means for selectively operatively engaging said main drive wheel with one of said support members to rotatably drive the selected support member in the direction for winding tape on the reel respectively coupled therewith in response to activation of said drive means by said control means; said transmission means including a freely rotatable idler wheel mounted in said apparatus for movement between a plurality of positions in and out of driven engagement with said main drive wheel to selectively transmit the driving force of said drive wheel to the selected support member; means for engaging said idler wheel against one of said reel support members, upon deactivation of said drive means, with sufficient force to brake rotation of that support member; and a further brake member to be selectively engaged against the other reel support member; the idler wheel and the further brake member being engaged against their respective reel support members in rapid succession so that the driven reel support member is braked before the undriven reel support member upon deactivation of said drive means.

3,918,661

PAPER ROLL HOLDER

Emitsu Kishi; Osamu Shinohara, and Haruhisa Ishikawa, all of Kawanoe, Japan, assignors to Shinhama Pump Mfg. Co., Ltd., Kawanoe, Japan

Filed July 30, 1973, Ser. No. 383,692
Int. Cl. B65h *19/00*
U.S. Cl. 242—55.2 **1 Claim**



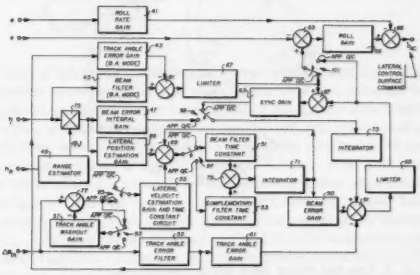
1. A paper roll holder for holding a roll of paper consisting of overlapping webs with perforations at regular intervals, said holder comprising a back plate, side plates projecting from the back plate for rotatably supporting a roll of paper, a lid pivotally connected to said back plate at the upper portion thereof, and a roller longitudinally provided on said lid at the front thereof and having a plurality of spaced bulges of greater diameter provided on the periphery of said roller to prevent twisting of the paper being withdrawn.

3,918,662

LOCALIZER LATERAL GUIDANCE CONTROL SYSTEM

Robert M. Vircks, and Henry F. Tisdale, both of Kent, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 21, 1974, Ser. No. 434,879
Int. Cl.[2] B64C *13/18*
U.S. Cl. 244—77 A **2 Claims**



1. An improved localizer lateral guidance control system suitable for use in an automatic aircraft landing system comprising:

A. combining means for receiving a localizer error with distortion signal and an estimated range signal and for combining said localizer error with distortion signal with said estimated range signal to generate a gain programmed beam error signal;

B. a beam filter connected to said combining means for receiving said gain programed beam error signal and for receiving an estimated signal proportional to lateral velocity, said beam filter combining said gain programed beam error signal with said estimated signal proportional to lateral velocity so as to generate an estimated lateral

deviation signal suitable for use by an aircraft to control the lateral control surfaces of the aircraft, said beam filter including:

1. a complementing gain circuit adapted to receive said estimated signal proportional to lateral velocity;
2. a summer connected to said complementing gain circuit, to receive the output of said complementing gain circuit, and to said combining means to receive said gain programed beam error signal; and,
3. a first order lag filter having a relatively long time constant, said first order lag filter comprising a complementary filter time constant circuit and an integrator, said complementary filter time constant circuit being connected to the output of said summer and the input of said integrator being connected to the output of said complementary filter time constant circuit, the output of said integrator forming said estimated lateral deviation signal; and,

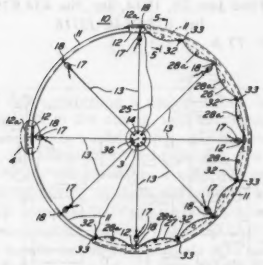
C. synchronizing means for synchronizing said beam filter during a beam acquisition mode of operation occurring prior to a guidance control mode of operation, said synchronizing means receiving signals representative of said localizer error with distortion signal, said gain programed beam error signal and said estimated signal proportional to lateral velocity and, in accordance therewith, applying associated synchronizing signals to said beam filter during said beam acquisition mode of operation.

3,918,663

CIRCULAR KITE

Floyd S. Cornelison, Jr., 244 S. Ninth St., Philadelphia, Pa. 19107

Filed Nov. 25, 1974, Ser. No. 526,913
Int. Cl.² A63H *27/08*; B64C *31/06*
U.S. Cl. 244—153 R **10 Claims**



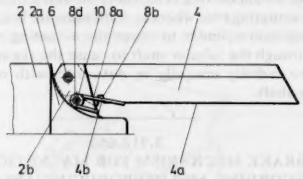
1. A kite for flying on a cord comprising
a rigid peripheral frame in a plane,
radially extending guy lines connected in tension to a central attachment member and to the peripheral frame,
a cover detachably carried on said frame in the plane of the frame,
a bridle comprising a plurality of bridle cords connected to said frame at spaced locations and a central bridle cord connected to said central attachment member,
a bridle lock having separable portions in engagement with said bridle cords and with respect to which said cords are simultaneously adjustable for retention at selected lengths for varying the inclination of said frame and cover, and
a leader connected to said bridle lock for attachment of the kite string.

3,918,664

LAUNCHABLE MISSILE HAVING A TAIL UNIT

Werner Grosswendt, Angermund, Germany, assignor to Rheinmetall G.m.b.H., Dusseldorf, Germany

Filed July 29, 1974, Ser. No. 492,875
Claims priority, application Germany, Aug. 24, 1973, 2342783
Int. Cl.² F42B *13/32*
U.S. Cl. 244—3.28 **2 Claims**



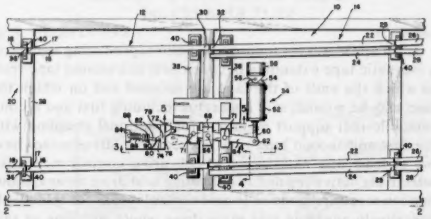
1. A launchable missile having a longitudinal axis and a tail unit including at least two guidewings symmetrically disposed with respect to said longitudinal axis and unfoldable upon launching, said missile having a body and a rear part provided with a pivot axle including at least one double-armed torsion spring, said guidewings being pivotable around said pivot axle, guided into an unfolded position and locked therein by means of said torsion spring, one arm of said torsion spring abutting said body of said missile, the other arm of said torsion spring abutting said guidewings, comprising a torsion-spring axle mounted on said missile and spaced from said pivot axle, and wherein said torsion spring is formed with a coil mounted on said torsion-spring axle and each of said guidewings has a guidewing edge formed with a recess, said other arm having a bent end locked in said recess when said guidewings are unfolded.

3,918,665

RAILROAD TYPE SWITCH

Mihai Alimanestianu, and Nicholas M. Alimanestianu, both of Upper Nyack, N.Y., assignors to Mihai Alimanestianu, Upper Nyack, N.Y.

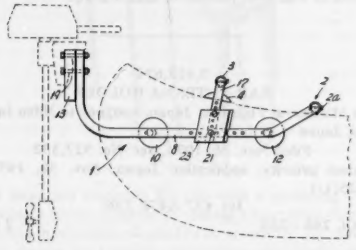
Filed Jan. 30, 1974, Ser. No. 438,021
Int. Cl.² E01B *7/00*
U.S. Cl. 246—415 **27 Claims**



1. A tracked vehicle switch assembly operatively connected between a single main track and a pair of diverging tracks, said switch asssembly comprising first and second generally longitudinally aligned movable track sections, said first and second track sections having first abutting end portions and second end portions respectively operatively connected to said main track and said pair of diverging tracks, said first track comprising a continuation of said main track and said second track section comprising a continuation of said pair of diverging tracks, means for selectively and simultaneously moving said first abutting ends of said track sections in opposite directions and in substantially the same plane to selectively align said first track section with the tracks of said second track section thereby selectively to direct a vehicle on said main track to

either of said diverging tracks; said means for moving said first ends of the track sections including a ram, a lever pivotally mounted intermediate its ends in said assembly and pivotally connected at one end to said ram for movement thereby between two extreme positions, means for pivotally connecting said lever to said first ends of said track sections, on opposite sides of its pivotal mounting, and spring biased toggle means for biasing said lever into the extreme position to which it is moved by said ram, whereby said first ends of the track sections are moved in opposite directions upon actuation of said ram.

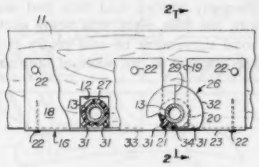
3,918,666
CANOE BRACKET
Nathaniel Florian, Plantsville, Conn., assignor to American Standard Company, Plantsville, Conn.
Filed Feb. 10, 1975, Ser. No. 548,871
Int. Cl.² B63H *24/26*
U.S. Cl. 248—4 **3 Claims**



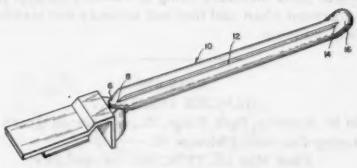
1. An outboard motor mounting for pointed end craft comprising,
   a tubular main frame roughly triangular in shape said frame including a pair of,
   elongated generally L-shaped arms,
   means for adjusting said arms toward and away from each other,
   a cross member mounted on said arms,
   a resilient cup-shaped member depending from said cross member,
   a plurality of resilient cup-shaped members mounted on said elongated arms in opposing locations and having their concave sides opening to the interior of said roughly triangular main frame,
   a motor support fixed to said L-shaped arms at the apex of said roughly triangular main frame
whereby all the cup-shaped members engage a surface of said craft for holding the frame and motor thereto.

3,918,667
MOUNTING FOR PIPES AND CONDUITS IN STUDS AND JOISTS
James E. Madden, 14826 Skylind Blvd. Apt. 4, Woodside, Calif. 94062
Filed Oct. 18, 1973, Ser. No. 407,534
Int. Cl.² F16L *5/00*
U.S. Cl. 248—56 **2 Claims**

1. For use in mounting a pipe extending through a notch in a stud, in combination, a sheet metal reinforcement of L-shape cross-section having a first and a second flange disposed at right angles to each other and joining at a corner, said first flange formed with a slot extending from its outer edge to said corner, said slot having a keyhole-shape enlargement at said corner and notches formed in said first flange at said keyhole-shape enlargement, both said flanges being formed with holes for fastening means to attach said reinforcement to a stud, and a sleeve comprising a cylindrical portion having an outside diameter less than that of said keyhole enlargement and greater than the width of said slot remote from said keyhole enlargement and having a peripheral flange at one end, said cylindrical portion and said peripheral flange formed with a slit to permit said sleeve to be distended and slipped over a pipe prior to assembly of said combination and then moved axially into assembled position with said peripheral flange in contact with said first flange and said cylindrical portion extending from said first flange on the same side of said first flange as said second flange, said sleeve being formed with ears complementary to said notches to locate said sleeve relative to said reinforcement and to restrain movement of said sleeve relative to said reinforcement after assembly, said peripheral flange being truncated at a chordal line aligned with said second flange.



3,918,668
CANTILEVER-TYPE DISPLAY UNITS
Richard M. Thorpe, Ashland, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
Filed Apr. 27, 1973, Ser. No. 355,358
Int. Cl.² A47F *3/14*
U.S. Cl. 248—205 A **2 Claims**



1. A display unit consisting of a base member and a movable support member adapted to extend from said base member for supporting objects, said base member having an attachment surface adapted to engage a horizontal support surface and an adjacent vertical surface integral therewith adapted to simultaneously engage a vertical support surface with said base member having a portion vertically offset above attachment surface to provide space to permit attachment of said base member to a support surface having a raised lip at the leading edge, adhesive means for securing said base to said horizontal support surface and means located on said vertical surface for pivotally connecting said base member and movable support member together whereby said movable support member is adapted to swing about said pivot means in a substantially coplanar relationship with said horizontal surface.

3,918,669
ARTICULATED POSITIONING DEVICE
George W. Osterhout, 6711 W. Homestead Drive, Indianapolis, Ind. 46227
Filed Nov. 1, 1974, Ser. No. 519,816
Int. Cl.² A47F *1/16*; B60R *9/04*
U.S. Cl. 248—206 R **1 Claim**

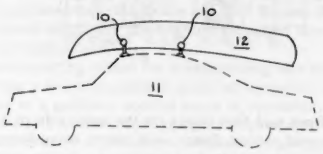
1. A device for releasably fixing a boat to the top of a motor vehicle, said device including a plurality of units, each unit comprising:

first plate member adapted to be removably fixed to a side of said boat, said plate having a first threaded aperture centrally thereof;

suction cup means adapted to be removably fixed to said vehicle top;

second plate member having a first unthreaded aperture there through;

first pivot member passing through said first unthreaded aperture, threadedly engaging said first threaded aperture, and pivotally joining said first and second plate members with the first pivot axis being such that said relative pivotal movement of said plates is in a plane approximately parallel to the plane of said boat side;



third plate member fixed to said second plate member and perpendicular thereto, said third plate member having a second threaded aperture centrally thereof;

fourth plate member linked to said suction cup, said fourth plate member having a second unthreaded aperture therethrough;

second pivot member passing through said second unthreaded aperture, threadedly engaging said second threaded aperture, and pivotally joining said third and fourth plate members with the second pivot axis being perpendicular to said first pivot axis;

said first and second plate members as well as said third and fourth plate members being in abutting face to face arrangement when said first and second pivot members are fully made up.

3,918,670

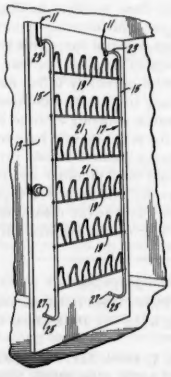
HANGER ASSEMBLY

Donald W. Doherty, Park Ridge, Ill., assignor to Queen Manufacturing Co., Inc., Chicago, Ill.

Filed May 10, 1974, Ser. No. 468,909

Int. Cl.[2] A47F 7/08; A43D 95/12

U.S. Cl. 248—214 **1 Claim**



1. A hanger assembly mountable on a door and similar structures to receive and support rods and tubing, said assembly including:

a bracket member, and

a support member connected thereto,

said bracket member formed from an elongated strap having a planar central portion, an end portion bent to project at right angles to the central planar portion, said bent end portion adapted to rest on top of a door and similar structures,

a prong formed as part of said bent portion and extending at right angles thereto, said prong being formed integrally with said bent portion of said strap and being located at the outward end of said bent portion, and

an offset portion formed at the opposite end of said strap, said offset portion being positioned on the opposite side of said planar portion from said bent projecting portion and extending parallel to the face of said door,

said support member comprising a cylindrical cup positioned with its base contacting and riveted to said offset portion of said bracket member, said cup being formed of a thin walled soft plastic and having its open portion facing in a direction opposite to the direction of projection of said bent portion of said bracket.

3,918,671

BAR ANTENNA HOLDER

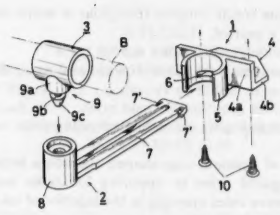
Akira Mizusawa, Fujisawa, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,332

Claims priority, application Japan, Nov. 30, 1973, 48-136725[U]

Int. Cl.[2] A47F 5/00

U.S. Cl. 248—285 **2 Claims**



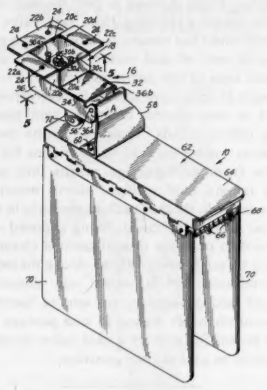
1. A three piece holder for bar antennas which comprise an adapter base adapted for mounting on a cabinet and including an arcuate housing element extending outwardly from said base, said arc housing having an aperture formed therein within the margins of said arcuate housing, a supporting arm member mounted on said base plate and consisting of an arm inserted within the aperture in said arc housing and capable of a sliding movement relative to said adapter base, said supporting arm member having an integral cylindrical supporting body provided at the opposite end of said arm member and having a dimension such that it is nestable in the arcuate housing as the arm is moved inwardly through said aperture, and a cylindrical holding member providing a housing to accept a bar antenna and having projecting from its outer wall a fastener element, said supporting body being provided with a stepped bore therein receiving the fastener of said cylindrical holding member to permit relative rotation of said cylindrical holding member relative to said supporting arm member, the assembly permitting relative movement of said bar antenna relative to the cabinet on which said assembly is adapted to be mounted.

3,918,672

DIRECTORY ASSEMBLY

Lawrence J. Torn, Woodbury, Long Island, and David F. Cammarota, Massapequa, both of N.Y., assignors to Redy-ref-Pressed & Welded, Inc., Long Island City, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,947
Int. Cl.[2] A47B 97/04
U.S. Cl. 248—447 6 Claims



1. A directory assembly for use with a mounting surface comprising a binder adapted to receive a telephone directory; a mounting mechanism adapted to be secured to the mounting surface; means for pivotally connecting said binder to said mounting mechanism for enabling said binder to move relative to said mounting mechanism in a first plane; said mounting mechanism including a support housing adapted to be secured to said mounting surface, a pivot arm pivotally movable about said support housing for enabling said binder to more relative to said mounting mechanism in a second plane substantially perpendicular to said first plane wherein the movement of the binder in said second plane is independent of movement of the binder in said first plane, means cooperating with said pivot arm and said support housing for selectively limiting the pivotal movement of said pivot arm about said support housing, where said means for selectively limiting the pivotal movement of said pivot arm about said support housing includes positioning elements and slot means, said positioning elements selectively engaging said slot means to limit said pivotal movement and wherein said support housing includes a bottom wall, said positioning elements being disposed within said bottom wall, and said pivot arm includes a top wall defining said slot means, said positioning elements being selectively disposed to extend through said bottom wall to engage said slot means.

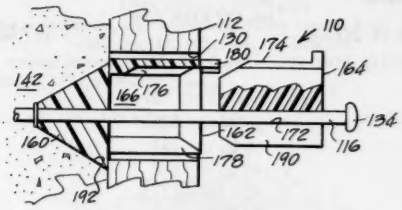
3,918,673

ROD WITH WALL FORM SEALING AND SPACING MEANS

Clyde H. Abbott, 1085-B Oak Hill Road, Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 381,806, July 23, 1973, abandoned. This application Jan. 22, 1974, Ser. No. 435,518
Int. Cl.[2] E04G 17/08
U.S. Cl. 249—43 18 Claims

1. A tie rod and cone assembly in combination with a pair of spaced-apart wall forms for use in temporarily positioning said pair of spaced-apart wall forms, the tie rod and cone assembly comprising rod means in the form of a generally elongated member defining an axis each end of which projects through a respective bore in said spaced-apart wall forms and a seal means for sealingly engaging said bore in a wall form and for sealing said bore against ingress and egress of fluid, said seal means positioned on each end of said rod means and comprising front, body means on said tie rod for contacting and sealing against the inner wall of said spaced-apart wall forms, and rear, generally cylindrical body means of a diameter less than that of said bore having an axial bore there-



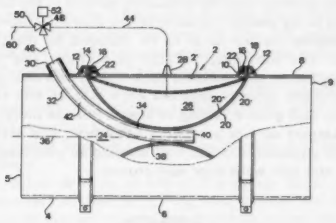
through, said tie rod extending through said axial bore, said rear body means further defining a pair of generally arcuate, bifurcated sidewall portions and retainer means on said tie rod engageable with said rear body means for camming said sidewall portions into sealing engagement with said wall form bore.

3,918,674

SHUTOFF DEVICE

Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed June 24, 1974, Ser. No. 482,097
Claims priority, application Switzerland, Sept. 3, 1973, 12581/73
Int. Cl.[2] F16K 7/07
U.S. Cl. 251—5 4 Claims



1. A shutoff device comprising a housing having an inlet opening and an outlet opening, an elastic hose body having opposed ends and arranged within said housing, means for securing the opposed ends of said hose body at said housing, said hose body forming a closable throughpassage which flow communicates the inlet opening with the outlet opening of the housing, said housing having an inner wall, said hose body being arranged within said housing such that there is formed a substantially ring-shaped pressure compartment between the housing inner wall and the hose body, a conduit connection provided at the housing and opening into said ring-shaped pressure compartment, a core portion extending approximately coaxially within the throughpassage, said core portion forming at its periphery a seating surface for the hose body, a nozzle provided in said core portion and directed towards the outlet opening, said nozzle being provided at an end of the core portion which confronts the outlet opening, a further conduit connection provided at the housing, said nozzle being operatively connected with said further conduit connection.

3,918,675
FLOW REGULATING DEVICE PARTICULARLY FOR INFUSION AND TRANSFUSION TUBES

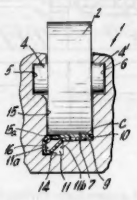
Hans-Jürgen Forberg, Lensahn, Holst, Germany, assignor to Transcodan, Germany

Filed Aug. 24, 1973, Ser. No. 391,133

Claims priority, application Germany, Aug. 30, 1972, 2242539

Int. Cl.² F16K 7/06

U.S. Cl. 251—6 **11 Claims**



1. A device for regulating the rate of flow in a flexible tube particularly for infusion and transfusion apparatus, comprising a tube receiver having a longitudinally extending clamping surface over which the tube to be clamped is positioned, a clamp member adapted to move over the clamping surface, guide means adjacent said clamping surface engaged with said clamp member and guiding said clamp member for movement in close proximity with the clamping surface along said clamping surface, at least one of said clamping surface and said clamp member peripheral surface having a groove adjacent an edge thereof extending longitudinally along its length and tapering inwardly in the direction of clamping member movement and defining an edge of an effective clamping surface which varies longitudinally between the ends of said groove, the tube to be clamped being positionable on the clamping surface and extending with a portion thereof into said groove, the portion of the tube to be clamped which is in said groove being reduced in cross section during the movement of the clamping member and the remaining portion of the tube to be clamped being positioned between the clamping member and the clamping surface so as to be clamped by the clamping member in a substantially flattened position, said tube receiver including side walls on each side of said clamping surface arranged directly adjacent each side of said clamping member, said groove having at least a portion thereof below said clamping surface extending away from said surface beyond the adjacent said side wall forming an overhanging portion of said side walls over said groove.

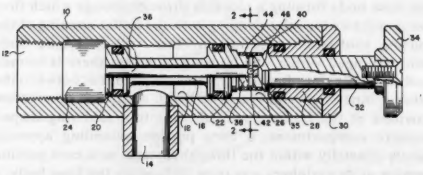
3,918,676
FLUSH VALVE

Earl W. Carson, 287 Hazard Ave., Enfield, Conn. 06082

Filed July 11, 1974, Ser. No. 487,711

Int. Cl.² E03D 3/04; F16K 21/06, 31/12

U.S. Cl. 251—51 **4 Claims**



1. A fluid valve including:

a valve body having a fluid inlet and a fluid outlet;

valve means in said valve body, said valve means being movable between a first position in which said fluid inlet is sealed from said fluid outlet and a second position in which said fluid inlet is in fluid communication with said fluid outlet;

a pair of spaced apart piston means on said valve means, said piston means having differential area whereby a fluid pressure generated force on said piston means urges said valve means toward said first position;

control chamber means in said valve body for containing fluid to control the rate of movement of said valve means from said second position to said first position, said control chamber being defined in part by said valve means; projection means extending from said valve means into said control chamber means, said projection means cooperating with one of said piston means to establish the differential area of the piston means;

passage means in said valve means for delivering fluid from said inlet to said control chamber, said passage means including orifice means in said projection means;

resilient sleeve means on said valve means for controlling fluid flow from said passage means into said control chamber means, said resilient sleeve means being exposed on one side thereof to fluid pressure in said passage means and said sleeve means being exposed on the other side thereof to pressure in said control chamber;

bleed means through said resilient sleeve means to provide fluid communication between said control chamber means and said passage means and to bleed fluid from said control chamber means to said passage means; and

actuator means for actuating said valve means from said first position to said second position.

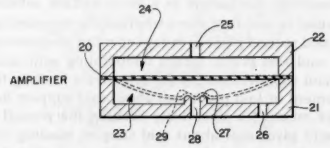
3,918,677
FLUID WAVEFORM SHAPING DEVICES

Larry Clyde Cowan, Saunderstown, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Nov. 8, 1973, Ser. No. 413,873

Int. Cl.² F16K 31/126

U.S. Cl. 251—61.1 **6 Claims**



6. A logic fluid element for processing on-off type digital waveforms to produce a change of signal waveform shape comprising in combination, an impervious thin flexible taut diaphragm clamped at its outer periphery between two members and movable into a flexed position in response to the differential pressure of fluid signals on opposite sides thereof, at least one chamber on one side of said diaphragm for confining fluid, means in said chamber defining a fluid flow path therethrough between an inlet and outlet port, diaphragm engaging structure comprising a smooth rounded protruding lip structure positioned concentrically about only one of said ports to extend inwardly from the chamber surface to engage the midregion of said diaphragm when flexed so that the diaphragm surface is indented by the lip structure on both sides of the lip to wrap about the smooth rounded lip surface, means closing the flow of fluid through said path by instituting a fluid control pressure of predetermined magnitude on the opposite side of said diaphragm to wrap said diaphragm about said lip structure with a central portion indented into said port, means establishing fluid under pressure in said flow path at a magnitude in the order of said fluid control pressure, and means for opening the passageway including a signal comprising a fractional reduction of said magnitude of said fluid control pressure and said fluid under pressure thereby opening the path between the inlet and outlet ports with a lower pres-

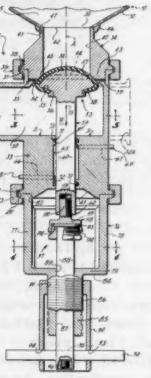
sure magnitude thereby to operate said element as an amplifying gate.

3,918,678

ASEPTIC BULK MATERIAL STORAGE SYSTEM AND IMPROVED ASEPTIC VALVE THEREFOR

Steve A. Rechtsteiner, Cincinnati, Ohio; Philip E. Nelson, West Lafayette, Ind., and Marinus deBonte, Mississanga, Canada, assignors to Purdue Research Foundation, Lafayette, Ind.

Filed May 6, 1974, Ser. No. 467,460
Int. Cl.² F16K *41/00, 51/00*
U.S. Cl. 251—144 **15 Claims**



1. Apparatus for storing bulk material under aseptic conditions comprising:

an aseptic tank having an opening in the wall thereof through which sterile bulk material passes when filling and/or emptying said tank, and

an aseptic valve connected between said tank opening and a bulk material conveying line, said valve including

a. a valve seat,

b. a valve closure element selectively positionable in engagement and disengagement with said seat to close and open said valve, respectively,

c. first and second cooperating valve body sections, said first body section having a cavity therein in which said valve closure element is positioned, a first port in said first body section connecting said cavity with said conveying line, a second port in said first body section also connecting to said cavity, said second body section having a passage therethrough terminating at an inner end in an inner opening surrounded by said valve seat and at an outer end in an outer opening,

d. means mounting said outer end of said second body section to said tank at an interface therebetween to connect said tank opening and said outer end of said passage, said mounting means being free of relatively rotatably movable surfaces of said second body section and tank through which contaminants can infiltrate directly into said tank should said first and second valve body sections rotate relative to each other,

e. means mounting said first body section to said inner end of said second body section along a common joint to connect said inner opening of said second body section to said cavity via said second port, said common joint being exposed to said cavity when said closure element and seat are engaged,

f. a valve stem connected at its inner end to said closure element and extending through said first valve body section for moving said closure element between its engaged and disengaged positions to close and open said valve, respectively, and

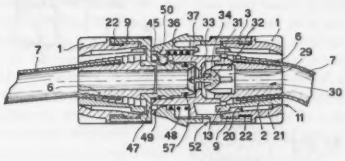
g. means incorporated in said first valve body section for establishing an aseptic barrier around said valve stem to prevent infiltration of contaminants into said cavity along the interface between said valve stem and first valve body section.

3,918,679

UNIVERSAL COUPLING

Baracchi Silvana, via Pontebbana, Fiume Veneto, Italy

Filed Dec. 15, 1971, Ser. No. 208,108
Claims priority, application Italy, Aug. 22, 1970, 83354/70; Jan. 1, 1971, 83302/71
Int. Cl.² F16L *29/00, 37/28*
U.S. Cl. 251—149.1 **14 Claims**



1. A universal hose coupling comprising:

male body means defining an open-ended bell at one end and a projecting externally and circumferentially grooved male element at the other end with a fluid passageway therethrough;

female body means defining an external housing portion and having an internal tubular wall portion defining an internal bore;

one end of said tubular wall portion of said female body means projecting beyond said housing portion and defining an internal bore operative to axially receive said projecting male element at an interface in circumferentialiy sealed relationship with the fluid passageway of said male element open therethrough;

a slot through the tubular wall portion of said female body means opening into said internal bore and radially opposite one of said external grooves of said male element when in said sealed relationship;

collar means encompassing and slidably carried by said projecting wall portion of said female body for axial reciprocation thereon;

stop means limiting the axial reciprocation of said collar means;

said collar defining at one end a recess larger than the diameter of said projecting wall portion and having a tubular portion encompassing said projecting wall portion of said female body in sliding relationship adjacent said recess;

means biasing said collar means against one of said stop means with said recess registering over said arcuate slot in said tubular wall of said female body means; and

fastening means carried in said slot and engageable across said interface with a groove of said male element to maintain a locked relationship;

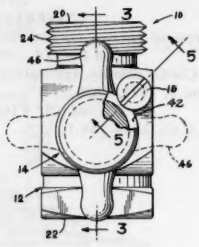
said fastening means comprising an arcuate member substantially conforming in curvature with the outside of said tubular portion of said collar means and having a larger non-conforming seat of curvature within said groove of said male element; and

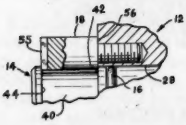
said fastening means being radially movable from said groove on said male element upon sliding said collar means against the other of said stop means whereby to register said recess of said coller means opposite said arcuate slot in said tubular wall portion of said female body means to release said fastening means from interengagement across said interface between said male and female body means.

3,918,680
STOPCOCK

Frederick F. Stevens, Jr., Fairfield, Conn., assignor to Hoff-Stevens, Inc., Ansonia, Conn.

Filed Feb. 5, 1974, Ser. No. 439,740
Int. Cl.² F16K *5/08*
U.S. Cl. 251—287 **11 Claims**





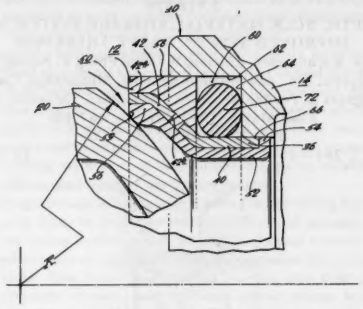
1. A stopcock comprising means defining a body having a bore therethrough and including an inlet opening and an outlet opening, said body having an inlet passageway communicating with said inlet opening and opening through the wall of said bore and an outlet passageway communicating with said outlet opening and opening through the wall of said bore, a turn plug having a connecting passageway extending therethrough and supported in said bore for coaxial rotation therein between open and closed positions, said connecting passageway communicating with said inlet passageway and said outlet passageway when said turn plug is in its open position to define a path for fluid flow through said stopcock, said connecting passageway being out of communication with at least one of the other passageways in the body when said turn plug is in its closed position, said turn plug having a shank extending axially outwardly beyond said body and including an annular axially outwardly facing first bearing surface and an annular axially inwardly facing second bearing surface, a stud having a part thereof threaded into said body and another part projecting outwardly from said body, said other part having a first axially inwardly facing abutment surface engaging said first bearing surface and a second axially outwardly facing abutment surface engaging said second bearing surface, said stud retaining said turn plug in assembly with said body and restraining it against axial movement in either direction relative to said body, and means on said turn plug for engaging said stud to limit rotational movement of said turn plug between open and closed positions relative to said body.

3,918,681
VALVE SEAT INSERT

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed May 30, 1974, Ser. No. 474,375
Int. Cl.² F16K *5/00*
U.S. Cl. 251—317 **7 Claims**

1. A valve comprising a casing having inlet and outlet ports and a rotary valve element operable between a first position closing flow between said ports and a second position permitting flow therethrough, an annular seal seat insert mounted for axial movement in a pocket formed in said casing in registration with one of said ports and in sealing engagement with said valve element, a sealing ring mounted in said pocket and engageable by said seat seal insert, said seat seal insert comprising a generally cylindrical annular portion underlying said pocket and an offset outwardly directed flange and an insert housing made of a resilient material at least partially encapsulating said reinforcing member on the surface thereof con-

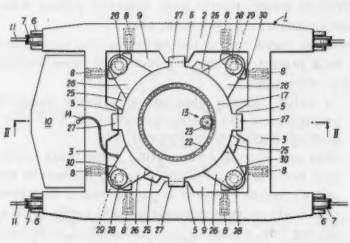


fronting said valve member and including a bulbous section adjacent the flange portion having a peripheral bead engageable with said valve element and rear face engaging said sealing ring.

3,918,682
TRANSPORTING AND LIFTING VEHICLE FOR HEAVY LOADS

Friedrich Despalmes, Vienna, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 18, 1974, Ser. No. 434,635
Claims priority, application Austria, Feb. 15, 1973, 1337/73; July 23, 1973, 6470/73
Int. Cl.² B60S *9/14*; **B61F** *5/00*; **B25J** *5/02*; **C21C** *1/00*
U.S. Cl. 254—87 **20 Claims**



1. A transporting and lifting vehicle for a heavy load, e.g. a converter exchange vessel in a steel production plant, comprising a travelling frame and a lifting-rotating mechanism adapted to rest on said travelling frame, but not being mechanically connected to it, said lifting-rotating mechanism comprising:

at least two closed concentric rotating frames for rotating said travelling frame for transposition into different directions of travel and for rotating the load, said rotating frames being connected together in the axial direction and rotatable reltive to each other, said rotating frames having projections that allow them to be individually supportable on said travelling frame when in certain angular positions and passing through said travelling frame when in other angular positions;

means for rotating said rotating frames about a central axis; and

extendable and retractable lifting means attached to at least one of said rotating frames for acting against a support surface to lift said rotating frames to a certain lifting height relative to the support surface and to lower them,

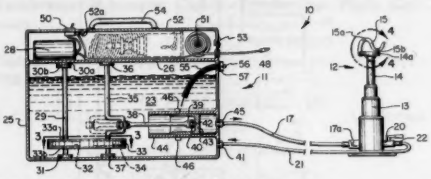
the certain lifting height being smaller than the total height to which said vehicle can lift the load.

3,918,683

ELECTRO-HYDRAULIC JACK

Daniel J. Millar, 308 Sidney St., Rock Springs, Wyo. 82901

Filed Jan. 9, 1974, Ser. No. 431,675
Int. Cl.² B66F *3/24*
U.S. Cl. 254—93 R **3 Claims**



1. An electro-hydraulic jack comprising

a jack assembly having telescoping body sections and a ram adapted to project therefrom as the outermost extending body section, and an enlarged bearing surface on the end of the ram projecting from the body;

a power unit including a housing, a reservoir in the housing, oil in the reservoir, a pump in the reservoir, an electric motor in the housing, means coupling said motor to said pump whereby operation of the motor operates said pump to pump said oil, said means including

a shaft extending through the reservoir and connected to an output of the motor,

a crank shaft having a principal axis extending parallel to the shaft,

gear means interconnecting the shaft and the principal axis of the crank shaft, and

a link pivotally connected to the eccentric of the crank shaft and to a piston of the pump;

flexible conduit means including one-way valve means, interconnecting the pump and the interior of the jack assembly;

flexible conduit means interconnecting the interior of the jack assembly and the reservoir; and

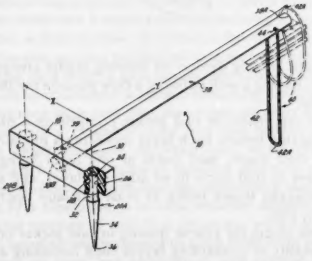
control valve means in the conduit means interconnecting the interior of said jack assembly and said reservoir.

3,918,684

MULTIPLEX ELECTRICAL CONDUCTOR SPREADER

Manuel A. Pyles, Cincinnati, Ohio, assignor to The Utilco Company, Cincinnati, Ohio

Filed Mar. 26, 1975, Ser. No. 562,178
Int. Cl.² B66F *3/00*
U.S. Cl. 254—131 **6 Claims**



1. A tool for spreading apart a specified distance a pair of twisted conductors of a triplex conductor assembly extending in a predetermined direction comprising:

a generally straight elongated bar,

first and second studs each having an inner end secured to said bar and an outer end, said studs being disposed generally parallel to each other and extending from said bar in the same direction with a separation therebetween approximately equal to the specified distance it is desired to spread the twisted conductors, said studs each further being disposed generally perpendicular to said bar, each stud having a generally conical outer end to facilitate initial partial insertion between the twisted conductors and a circumferenital groove proximate said inner end for seating one of the twisted conductors of the triplexed assembly when the conductors are spread apart,

a generally straight elongated handle having an inner end and an outer end, said inner end of said handle being secured to said bar to dispose said handle generally perpendicular to both said bar and said stubs to facilitate, when said handle is rotated **90°** about an axis parallel to said studs, rotation of said bar from a first position parallel to said conductors, with the studs inserted between said conductors seated in the grooves thereof and the conductors closely spaced, to a second position perpendicular to said conductors with the studs between said conductors engaged in the grooves thereof and the conductors spread apart, and

a fastener connected to said outer end of said handle, said fastener being engageable with said twisted conductors at a point spaced from said studs when said handle is disposed parallel thereto to maintain said bar perpendicular to said twisted conductors with the twisted conductors seated in said grooves and spread apart by said studs.

3,918,685

CONVERTIBLE CONDUCTOR STRINGING ASSEMBLY FOR POWER LINE USE

L. E. Lindsey, Pasadena, and Herbert F. Sammons, Glendale, both of Calif., assignors to Lindsey Manufacturing Company, Pasadena, Calif.

Division of Ser. No. 259,315, June 2, 1972, Pat. No. 3,822,862, which is a continuation of Ser. No. 55,056, July 15, 1970, abandoned. This application Nov. 23, 1973, Ser. No. 418,475
Int. Cl.² B65H *59/00*
U.S. Cl. 254—134.3 PA **6 Claims**

1. A clamping accessory for use in securing a conductor stringing block to a rigidly mounted power line insulator, said accessory comprising a rigid main body having one side thereof formed with a wide deep groove adapted to seat against one lateral side of power line insulators of different diameters, a wide flexible clamping band hingedly connected to said main body adjacent one lateral side of said groove, adjustable clamping means for detachably and rigidly coupling the other end of said band to the other lateral side of said groove, a sheave-equipped stringing block having a support provided with a mounting shank, and means for quickly and rigidly detachably coupling the shank of said stringing block to the main body of said clamping accessory with the sheave of said stringing block disposed along one lateral side of the insulator.

3,918,686

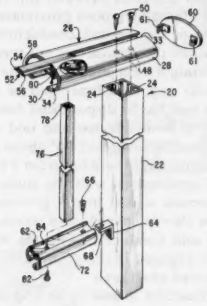
RAILING SYSTEM

Ken E. Knott, 552 Neponsit St., Venice, Fla. 33595, and Alan J. Dodd, 3032 Smith Ave., Bradenton, Fla. 33507, assignors to Alan J. Dodd, Bradenton, Fla.

Filed Aug. 13, 1973, Ser. No. 387,599

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **13 Claims**



1. A railing system comprising

a plurality of spaced posts having lower ends adapted to be mounted on a support and upper ends;

an elongate top rail having a top portion defining a surface with a centrally positioned longitudinal slot therein, a longitudinal mounting member disposed below said top portion and accessible through said slot, and a pair of curved longitudinal legs depending from opposite sides of said top portion and terminating at confronting edges spaced below said mounting member and engaging said posts adjacent said upper ends such that said legs provide a spring tension on said posts to prevent said posts from rattling or working loose, said top portion, said legs and said mounting member being integrally formed as a one-piece component;

means securing said upper ends of said posts to said mounting member; and

an elongate insert strip removably received in said slot in said top portion of said top rail and having a width substantially the same as the width of said slot whereby said securing means are concealed from view by said insert strip.

3,918,687

STRUCTURE FOR ENCAPSULATING ARTICLES WITH VISCOUS COMPOSITIONS SUCH AS CASTING RESINS

Gerd-Jan Hübers, No. 72, and Wilhelm Holtmann, Wehrstrasse, both of 4291 Suderwick, Germany

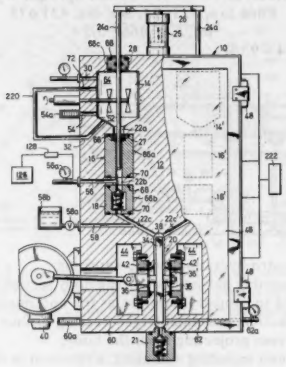
Filed Mar. 12, 1973, Ser. No. 340,444

Claims priority, application Germany, Mar. 17, 1972, 2212980

Int. Cl.² B01F *15/02*; B65B *31/00*

U.S. Cl. 259—4 **23 Claims**

1. A structure for use in encapsulating articles with viscous compositions, comprising, in combination, a solid base member formed of a metal exhibiting good thermal conductivity and having a plurality of recesses therein in which are embedded a pre-mixer for receiving and pre-mixing viscous material, a metering pump connected to said pre-mixer, a check valve connected to said metering pump, and a continuous flow-type mixer connected to said check valve, said pre-mixer, metering pump, check valve, and continuous flow-type mixer being formed as components comprising block-like modules, said components being fitted releasably into said recesses, said recesses having substantially the same contours as said block-like modules, said solid base member having additionally embedded therein a plurality of channels including viscous material inlet means connected to said pre-mixer, premixer outlet conduit means connecting said pre-mixer to said metering pump, metering pump outlet conduit means connecting



said metering pump to said check valve, and check valve outlet conduit means connecting said check valve to said continuous flow-type mixer, said continuous flow-type mixer further including an outlet opening for viscous compositions.

3,918,688

STATIC MIXING DEVICE

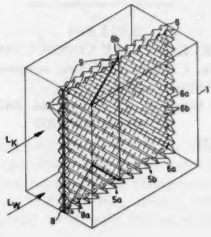
Max Huber, and Gerhard Schutz, both of Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,346

Claims priority, application Switzerland, Apr. 18, 1973, 5589/73

Int. Cl.² B01F *5/00*

U.S. Cl. 259—4 **9 Claims**



1. A static mixing device for flowing media comprising

a jacket having a wall defining a flow passage for the flowing media;

at least one insert in said jacket comprising a plurality of contacting layers, each layer including a plurality of parallel flow ducts, said ducts in one layer being inclined relative to said ducts in an adjacent layer, and said ducts in adjacent layers being at least partially open to each other; and

a second insert for coarse mixing in said jacket comprising a plurality of contacting layers each including a plurality of parallel inclined flow ducts, said ducts in adjacent layers being at least partially open to each other in an edge zone adjacent said jacket wall and closed to each

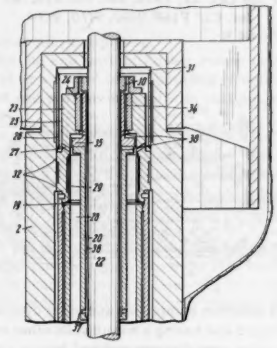
other in a middle zone of said second insert, said second insert being disposed upstream of said first insert.

3,918,689

COOLING MEANS FOR RADIAL BEARINGS IN NUCLEAR REACTOR PUMPS OR THE LIKE

Karl Gaffal, Hessheim; Ernst Honold, and Rolf Martens, both of Frankenthal, all of Germany, assignors to Sulzer KSB Kernkraftwerkspumpen GmbH, Frankenthal, Pfalz, Germany

Filed Dec. 7, 1973, Ser. No. 422,887
Claims priority, application Germany, Dec. 7, 1972, 2259832
Int. Cl. B01f 7/20
U.S. Cl. 259—105 10 Claims



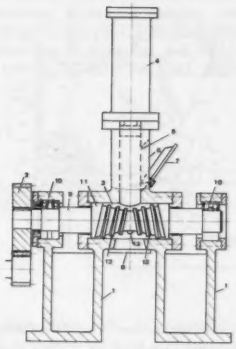
1. In an arrangement for circulation of liquid in a nuclear reactor, the combination of a vessel arranged to contain a supply of hot fluid and including a support having an opening; a tubular member secured to said vessel and extending with clearance through said opening and into said vessel so as to be surrounded by hot fluid; a pump shaft rotatable in said tubular member and having a first impeller installed in said vessel to circulate the fluid therein; a tubular bearing element provided in said tubular member in the interior of said vessel and having a first portion nearer to said opening and tightly fitted into said tubular member and a second portion defining with said tubular member a first annular clearance; a bearing sleeve fixedly received in said second portion of said element and spacedly surrounding said shaft; a first tubular mounting member connected with said element; a second mounting member located in and defining with said first mounting member an annular coolant receiving chamber, said first and second mounting members being disposed between and being respectively spaced apart from said tubular member and said shaft, said element having at least one passage connecting said chamber with said first clearance; a second impeller mounted on said shaft in that portion of said first clearance which is remotest from said opening and arranged to draw fluid from said chamber through at least one channel of said second mounting member, through a second clearance between said second mounting member and said shaft, through a third clearance within said bearing sleeve, and into said first clearance.

3,918,690

CLOSED MIXER FOR RUBBER, PLASTICS AND THE LIKE

Giovanni Coscia, Malnate, Italy

Continuation of Ser. No. 275,048, July 25, 1972, abandoned.
This application Feb. 1, 1974, Ser. No. 438,681
Claims priority, application Switzerland, Aug. 11, 1971, 011834/71
Int. Cl.² B29B 1/06
U.S. Cl. 259—191 3 Claims



1. A closed mixer for rubber and plastic materials comprising:

a. means comprising side and end rolls having internal surfaces defining an elongated closable mixing chamber, said chamber having a central portion and opposed end portions, said walls defining at least one opening therethrough in communication with said chamber for input and discharge of said materials;

b. means for closing said opening during mixing to provide a completely closed mixing chamber;

c. a rotor operatively mounted in said chamber for rotation about an axis extending longitudinally within said chamber, said rotor including a screw block extending through said chamber between said end portions with right and left-hand threads starting from opposite end portions of said block respectively and meeting in the vicinity of the central portion of said chamber, with said screw block in the form of two truncated cones joined at the smaller ends of said cones, the threads of said block having surfaces in sufficiently spaced relation from the internal surfaces of said chamber to permit movement of material between the threads and said internal surfaces, the rotor being rotatable to cause the material to move along the threads toward the central portion and along the internal surfaces toward the ends of said chamber; and

d. means operatively connected to said rotor for rotatably driving said rotor about said axis.

3,918,691

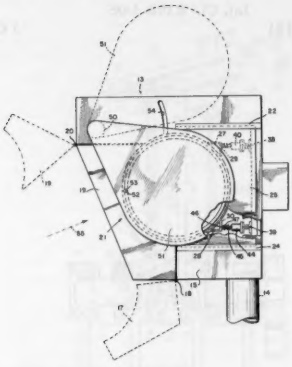
RECOIL SYSTEM FOR FURNACE CHARGER

Robert C. Overmyer, Indianapolis, Ind., assignor to Hawley Manufacturing Corporation, Indianapolis, Ind.

Filed May 28, 1974, Ser. No. 473,332
Int. Cl.² C21C 5/40
U.S. Cl. 266—16 2 Claims

1. For use with a melting furnace having an upwardly opening mouth, a hood constructed and arranged to rest on the top of such a furnace in enveloping relation to said mouth, said hood including upstanding side walls and a roof closing the top of said hood, said hood having at least one section hingedly supported from the major portion of said hood to swing out-

wardly from said major portion to open a lateral entry to a position within said hood registering with said mouth, said entry being proportioned and designed to afford entry of a charging bucket to such registering position, said one section including a section of said roof and a corresponding section of



said side walls, another section of said roof substantially opposite said entry being mounted for sliding movement toward and away from the axis of said mouth, and spring means yieldably resisting movement of said last-named section away from said axis.

3,918,692

APPARATUS FOR REFINING MOLTEN METALS AND MOLTEN METAL REFINING PROCESS

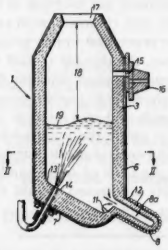
Karl Erik Öberg, Borlange, Sweden, assignor to Uddeholms AB, Hagfors, Sweden

Filed Mar. 11, 1974, Ser. No. 450,234

Claims priority, application Sweden, Mar. 12, 1973, 7303382

Int. Cl.² C21C 5/42

U.S. Cl. 266—35 **9 Claims**



1. Apparatus for treating a molten metal with a gas/solid suspension comprising a refractory lined, tiltable converter for holding the molten metal, said vessel having a wall and a bottom and being tiltable about an axle bar; means for introducing the metal to be treated and means for removing the metal after treatment; at least one tuyere for introducing the gas/solid suspension into the converter, said tuyere extending through the bottom or wall of the vessel at a level that will be below the surface of the molten metal when the converter is in its vertical operating position; the refractory lining of the converter being of sufficient thickness to resist wear during operation; said converter having at least one heating zone spaced away from the converter, the heating zone having at least one channel in liquid communication with the converter, the channel opening into the converter at a level that will be below the surface of the molten metal when the converter is in its vertical operating position, and essentially in the region of that point in the vessel which is the deepest point when the converter is in its vertical operating position, said heating zone having a refractory lining which is thinner than the refractory lining of the converter, and having means for heating the contents of the zone by electric induction heating to an extent such that a temperature gradient can be established between the contents of the zone and the contents of the converter and wherein the bottom of the vessel is inclined at an oblique angle with respect to at least one side of the vessel so that the vessel tapers towards the deepest point of the vessel, in the region of which the channel opening is located, when the converter is in its vertical operating position.

3,918,693

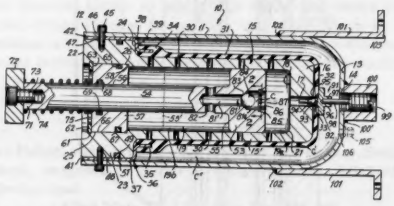
SHOCK ABSORBER

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Oct. 21, 1974, Ser. No. 516,769

Int. Cl.² F16F 9/00; 9/10, 9/34

U.S. Cl. 267—64 R **6 Claims**



1. A shock absorber comprising and outer cylindrical casing closed at one end and having a mouth at its other end, an inner cylindrical casing closed at one end and having a mouth at its other end, said inner casing being positioned in said outer casing coaxial therewith and transversely placed therefrom to define an elongated annular chamber, said inner casing having a body portion having passageways therethrough, an elongated resilient deformable and expandible substantially cylindrical bladder positioned in said annular chamber and extending substantially the length thereof and encompassing said inner casing to define a variable volume liquid chamber between the inner casing and said bladder, said bladder being closed at one end and having a mouth at its opposed end, an annular supporting member of rigid material having a cylindrical retaining portion and a reduced diameter mounting portion, the junction between said portions defining an annular shoulder, the mouth of said bladder being secured to said mounting portion, the portion of said inner casing adjacent its mouth being of enlarged diameter, the junction between said enlarged diameter mouth portion and the body portion of said casing defining an annular shoulder, said annular supporting member being positioned in the mouth of the outer casing with the cylindrical retaining portion in juxtaposition with the wall of the outer casing, said enlarged diameter mouth portion of the inner casing being positioned in said supporting member with the outer surface of said enlarged diameter portion of said inner casing in juxtaposition with the wall of the cylindrical retaining portion and with the annular shoulder of the enlarged diameter mouth portion abutting against the annular shoulder of said supporting member and means to retain said inner casing and said annular supporting member in fixed sealed position with respect to the outer casing, a closure member having an axial bore, positioned in the mouth of said inner casing, means retaining said closure member in fixed position, a piston slidably mounted in said inner casing, said

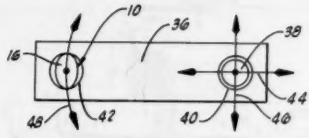
piston defining a variable volume chamber on each side thereof, said piston having a piston rod extending axially therefrom through the axial bore in the closure member, check valve means to permit flow of liquid only from one of said chambers to the other, and means to extend said piston rod outwardly from said closure member.

3,918,694

LOCATOR PIN

Richard D. Laudick, 314 E. Lyon, Lyons, Kans. 67554

Filed May 6, 1974, Ser. No. 467,464
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—47 **8 Claims**



1. A locator pin, comprising:

a. a mounting end portion having means to rigidly mount said pin in a socket of a supporting structure;

b. a head end portion integral with said mounting portion, and

c. said head end portion being of a cylindrical form oblong in cross section with the ends of the cross section being arcuate, said head end portion extending from said supporting structure when said pin is mounted and having means to removably receive and temporarily mount an aperture of a workpiece,

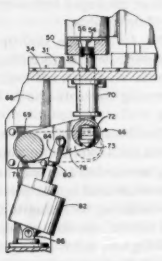
said locator pin in use is constructed and adapted to have said mounting end portion rigidly mounted in a tooling jig or the like with said head end portion extending from said tooling jig to removably receive and temporarily mount a workpiece, or the like.

3,918,695

CLAMP FOR PRECISION CUTTING TOOL

John W. Baker, 4 Wachusetts Drive, West Acton, Mass. 01720

Division of Ser. No. 273,385, July 20, 1972, Pat. No. 3,820,233. This application Apr. 26, 1974, Ser. No. 464,474
Int. Cl.² B25B *1/24*
U.S. Cl. 269—87.2 **7 Claims**



1. A clamp for holding a workpiece firmly against a work table and thereby to enable the precision cutting of said workpiece, said clamp comprising

A. two elongate clamp members defining a slot between said clamp members said slot adapted to form a travel path for a cutting tool;

B. A plurality of downwardly extending biasing means arranged along the length of each said clamp member, said biasing means adapted to provide means for biasing said clamp and said workpiece to assure clamping contact of said workpiece against said work table;

C. means to raise said clamp vertically from said work table to provide a variable clearance between said table and said clamp, and

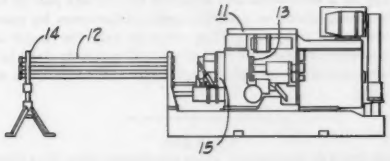
D. means to maintain substantially constant clamping pressure on said clamp at variable clearances from said table.

3,918,696

COMPOSITE STOCK TUBE

Chester E. Jameson, Richmond Heights, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Dec. 9, 1974, Ser. No. 530,738
Int. Cl.² B23Q *3/00*; F16L *11/00*
U.S. Cl. 269—287 **16 Claims**



1. A composite stock tube for supporting bar stock of square, round, hexagonal or other cross-sectional shape to be rotated by and processed in a single or multiple spindle machine tool, said composite stock tube comprising, in combination;

an outer support having an inside surface in a generally tubular configuration,

a bar stock liner adapted to accommodate the rotatable bar stock and including a plurality of tubular segments each with a generally cylindrical inner surface,

means to support said segments in substantially axial alignment within said outer support and with a majority of the length of each segment spaced from said inside surface of said outer support.

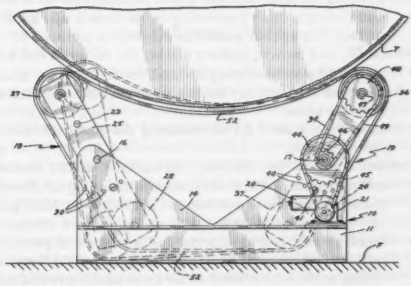
and means including said individual tubular segments having small enough physical dimensions to limit the noise vibrations to a frequency range greater than 2,000 Hz. upon a bar rotating within said tubular segments.

3,918,697

MACHINE FOR ROTATABLE SUPPORTING A TANK DURING THE MANUFACTURE THEREOF

Kenneth H. Gregory, Rte. 2, Box 229, Cadott, Wis. 54727

Filed July 15, 1974, Ser. No. 488,454
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—289 **3 Claims**



1. A machine for supporting and rotating the end of a cylindrical tank comprising,

a. a base frame,
b. support means journaling upper and lower pairs of rollers on the frame on parallel axes with the upper pair being in substantial horizontal alignment,
c. an endless belt of flexible material trained around all of said rollers and having slack between said upper rollers to provide a curved sling for holding one end of a cylindrical tank,
d. motor means mounted on the frame for rotationally driving one of said rollers to move the belt thereover and cause the tank to rotate on its axis within the sling,
e. said support means comprising two pairs of elongated support bars mounted on the base frame in horizontally spaced generally upright positions, each pair of bars having one of the upper rollers journaled in between the upper portions thereof and one of the lower rollers journaled between the lower portions thereof, and
f. at least one pair of said support bars being pivoted medially on a horizontal axis whereby as said one pair of bars is swung about its axis the upper rollers may be moved toward or away from each other to vary the length and curvature of the sling so that each of variously sized tanks are supported on said upper rollers in addition to said sling.

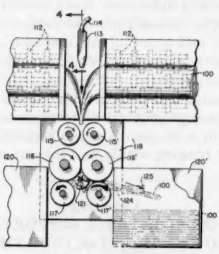
3,918,698
HIGH SPEED MACHINE AND METHOD FOR FOLDING PLASTIC BAGS AND THE LIKE

John B. Coast, Baton Rouge, La., assignor to Coast Machinery, Inc., Baton Rouge, La.

Continuation-in-part of Ser. No. 92,087, Nov. 23, 1970, Pat. No. 3,671,033. This application June 16, 1972, Ser. No. 263,703. The portion of the term of this patent subsequent to June 20, 1989, has been disclaimed.

Int. Cl.² B65H *45/12*

U.S. Cl. 270—69 **20 Claims**



1. A folding machine for folding flexible sheet material such as plastic bags and the like comprising;
rolling means for rolling the material into a roll comprising a rolling section disposed about at least 180° of a circle, said rolling section presenting on its inward side a moving surface throughout a substantial portion of said 180° of a circle, said moving surface driving the material into a roll, said rolling section being divided into at least two laterally disposed sub-sections having an open, unobstructed area therebetween;
introduction means for introducing the material into said rolling means;
removal means for removing the rolled material from said rolling means, said removal means including an extended pneumatic member extended in a direction at least generally perpendicular to the axis of the curved surface defined by said rolling section and a source of pneumatic pressure, the rolled material being removed from said rolling section by a blast of air from said source of pneumatic pressure to said extended pneumatic member directed through and across said open area, blowing the rolled material out of said rolling section; and
folding means for folding the rolled material as desired after it is removed from said rolling section by said removal means.

3,918,699
FOLDING MACHINE FOR SOFT GOODS

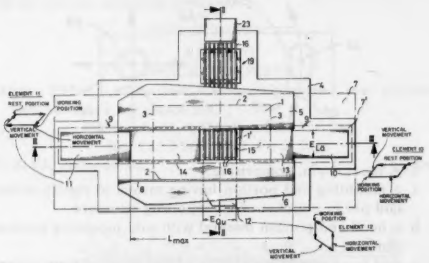
Conrad Arbter, Mittelweg 1 1/10, Saal an der Saale, Germany

Continuation of Ser. No. 368,942, June 11, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,374

Claims priority, application Germany, June 13, 1972, 2228808

Int. Cl.² B65H *45/00*

U.S. Cl. 270—69 **17 Claims**



1. A folding apparatus for the multiple folding of soft goods, comprising vertically spaced first and second folding stations, the latter being arranged below the plane of said first folding station;
said first folding station comprising:
a pair of longitudinal side folding arm means, and a pair of upper folding plate members having longitudinal edges, said longitudinal arm means being disposed above said upper plate members and movable in different horizontal planes with respect to each other,
said second folding station comprising:
a pair of transverse side folding arm means arranged below both horizontal planes of movement of the two longitudinal arm means, said transverse arm means having spaced apart front sides, and
a transverse side folding plate means operable to be disposed between said front sides in a working plane and cooperating with said transverse arm means for forming a transverse side fold in the soft goods;
a bearing surface arranged below the working plane of said transverse plate means;
means operable for moving said upper plate members in a horizontal direction toward each other, and in a verticale direction onto said pair of transverse arm means and thereby pressing the soft goods lying on said transverse arm means;
means operable for successively reciprocating said longitudinal arm means toward one another in their respective horizontal planes, said arm means folds said soft goods in cooperation with said upper plate members thereby successively producing two longitudinal folds, one on each longiudinal side of the soft goods;
means for moving said transverse plate means into the space between said front sides, and means for moving said transverse plate means downwardly for pressing a region of the partially folded soft goods onto said bearing surface, and
means to reciprocate said transverse arm means toward each other in a direction normal to the direction of reciprocation of said longitudinal arm means to fold said soft goods over said transverse plate means;
means for removing said upper plate members from the folded soft goods.

3,918,700

DOCUMENT DEFLECTING AND STACKING APPARATUS FOR USE IN DOCUMENT SORTING

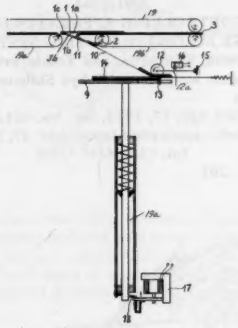
Sigmar Donner, Augsburg, Germany, assignor to Firma Kleindienst & Co., Augsburg, Germany

Filed Aug. 8, 1973, Ser. No. 386,591

Claims priority, application Germany, Aug. 19, 1972, 2240882

Int. Cl.² B65H 29/60, 31/10

U.S. Cl. 271—64 1 Claim



1. A document-sorting apparatus comprising:

guide means defining a path for documents to be sorted traveling along said path with a leading edge in a forwardly direction;

deflecting means for intercepting documents displaced along said path and deflecting same out of said path, said deflecting means comprising a first flat flexible and resilient arm and a second flat flexible and resilient arm including with said first arm an acute angle with the vertex turned in the direction opposite the direction of travel of said documents;

drive means engaging one of said arms for swinging said vertex transversely to said path whereby an arm of said deflecting means intercepts said path to guide an oncoming document, engaging the latter arm with its leading edge, downwardly along this latter arm, one of said arms being fixed at its end remote from said vertex;

a document-receiving platform spaced below said path and said latter arm and parallel to said path to define with said path a free-fall space traversed by a downwardly deflected document for receiving the downwardly deflected documents in succession;

an upstanding abutment disposed at said platform for engagement with the leading edges of the deflected documents as they deposit on said platform;

a roller juxtaposed with an upper surface of said platform adjacent said abutment and engageable with the documents deposited thereon for advancing same into engagement with said abutment, both of said arms being formed from strip-spring material, said drive means including an electromagnet for displacing the nonfixed arm, said roller being mounted for vertical displacement upon accumulation of documents in a stack on said platform; and

means for vertically displacing said platform downwardly with growth of said stack in response to the position of said roller, said platform being provided with a vertical supporting column, a lock member preventing downward displacement of said column in one position and permitting such displacement in another position, electromagnet means cooperating with said member for shifting same between said positions, an arm supporting said roller, and switch means operable by the arm supporting said roller for controlling said electromagnet means.

3,918,701

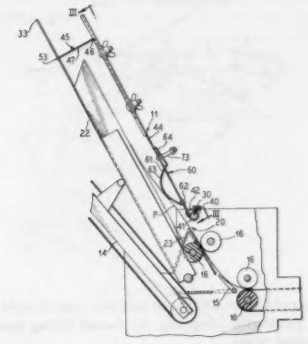
SHEET FED PAPER TRAY PAPER RETAINING ASSEMBLY

Harold Douglas Lee, 517 Maple Ave., Carpentersville, Ill. 60110

Filed June 13, 1974, Ser. No. 478,857

Int. Cl.² B65H 29/44

U.S. Cl. 271—181 8 Claims



1. A sheet fed paper tray paper retaining assembly comprising: an elongated arm positioned over a bed of a sheet fed paper tray, the bed being angled upwardly from the horizontal from an in-feed end thereof, the arm having a major portion thereof substantially parallel to the bed of the tray, the arm having a first end pivotably suspended above the tray at the in-feed end of the tray whereby paper entering the tray passes between the first end and the in-feed end of the tray, a deflector member having portions thereof depending from the elongated arm spaced from the first end, the deflector member having an attachment end pivotably attached to the elongated arm and a free end movable towards and away from the elongated arm with an intermediate portion depending from the arm towards the tray bed, the pivotable attachment being loose and allowing free rotation of the deflector at the pivot, the intermediate portion being movable away from the bed and being positioned to contact the sheet of paper entering the feed end of the tray to deflect the paper towards the bed of the tray.

3,918,702

COPIER AND SHEET STRIPPING FINGER THEREFOR

Nandor Mihalik, Walton-on-Thames, and Nicholas Gilbert Shreeve, Weybridge, both of England, assignors to Gestetner Byfleet Limited, London, England

Filed Feb. 21, 1974, Ser. No. 444,372

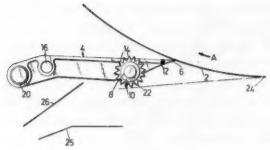
Claims priority, application United Kingdom, Feb. 23, 1973, 9050/73

Int. Cl.² B65H 29/56

U.S. Cl. 271—174 13 Claims

1. A copier including a drum rotatable in one direction about an axis and having a peripheral surface and means for carrying a copy sheet on said peripheral surface; means defining a forwarding path for copy sheets from said drum; stripping finger means positioned adjacent said drum; stripping tip means of said stripping finger means positioned in contact with said drum; means biasing said stripping tip means against said peripheral surface of the drum; wheel means; shaft means carried by said stripping finger means and mounting said wheel means for rotation about an axis parallel to the axis of rotation of said drum and located immediately downstream of said stripping tip means in the direction of the sheet movement along said forwarding path; said drum and said wheel means sharing a common tangential plane from which any point on the drum surface moves during its approach to said

stripping tip means, and to one side of which the drum and wheel means both lie, said stripping finger means being shaped

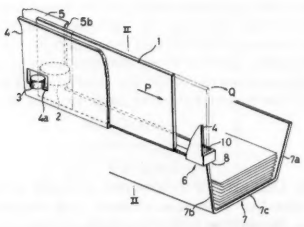


and positioned to lie entirely to said one side of said common tangential plane, the stripping tip means being spaced from said tangential plane.

3,918,703
CARD STACKER

Hiroshi Mano, Yokohama, and Hiroshi Yamada, Ichikawa, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1974, Ser. No. 534,148
Claims priority, application Japan, Dec. 19, 1973, 48-141312
Int. Cl.² B65H *29/26*
U.S. Cl. 271—185 **4 Claims**



1. A stacker for thin and relatively stiff cards comprising:

a guide having a first and a second upright wall connected at their bottom edges by a bottom wall, said walls defining therebetween a path for a card travelling in a plane parallel to the planes of the upright walls, with an edge of the card supported by the bottom wall of the guide;

a card tray having a first and a second upright wall connected at their bottom edges by a bottom wall, said upright walls of the tray being spaced from each other by a distance exceeding the upright dimension of the card when the card is travelling along the card path in the guide;

means for supporting the guide and the tray in a position in which the upright walls of the guide and of the tray extend along the same direction, the bottom wall of the guide is at the height of the upper edge of the first upright wall of the tray and adjacent thereto, the upright walls of the guide lean toward the tray, and the second upright wall of the guide is closer to the second upright wall of the tray than the first upright wall of the guide;

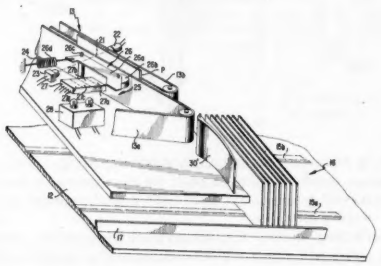
means defining an opening in said second upright wall of the guide which is larger than the card and is aligned with the tray along the direction of the card path; and

means for moving successive cards along said card path at a speed at which each card falls by gravity sideways toward the tray through said opening in the second upright wall of the guide, whereby the successive cards which fall by gravity through said opening come to rest stacked flat over each other and parallel to the bottom wall of the tray.

3,918,704
STORAGE CONTROLLING APPARATUS FOR A SHEET-LIKE MATERIAL SORTING SYSTEM

Satoshi Sugiyama, Kanagawa, and Yoshio Ariga, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 17, 1974, Ser. No. 461,648
Claims priority, application Japan, Apr. 27, 1973, 48-49726
Int. Cl.² B65H *31/06*
U.S. Cl. 271—201 **7 Claims**



1. A storage controlling apparatus for sheet-like materials comprising:

conveyor belt means for conveying sheet-like materials,

a movable head for supporting a terminal portion of the conveyor belt means,

means for moving the movable head in a direction to intersect the direction of the conveying path of the sheet-like materials,

a storer disposed adjacent to the movable head and adapted to receive the sheet-like materials conveyed by the conveyor belt means,

means for detecting the thickness of each sheet-like material as it is conveyed toward the storer; and

means connecting the movable head moving means and the thickness detecting means for moving the movable head a distance corresponding to the thickness detected of each sheet-like material.

3,918,705
PROCESSING CONTROL DEVICE FOR PRINTING MACHINES

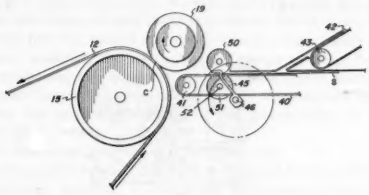
Gilbert E. Koch, Rochester, and Lawrence C. Hubler, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 284,834, Aug. 30, 1972, Pat. No. 3,804,507. This application Sept. 4, 1973, Ser. No. 394,372
Int. Cl.² B65H *9/10*
U.S. Cl. 271—243 **4 Claims**

1. A sheet handling apparatus including means when energized for separating seriatim sheets of support material from a stack, a conveying path along which the separated sheets are conveyed, programming control circuit operable in cycles of control signals for controlling the energization of said separating means one energization for each cycle, a movable abutment arranged to be moved into and out of engagement with

the sheets of support material for registering each sheet on the fly as the same moves along said conveying path without stopping,

switching means connected in the programming circuit for determining the cycles of the programming circuit and



actuable into a controlling condition for each registered sheet of support material, said switching means including a switch, and an actuator element for actuating said switch for each sheet of material as the sheet moves past a predetermined position in said conveying path without stopping.

3,918,706

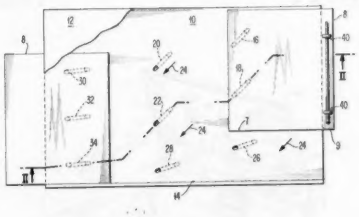
PNEUMATIC SHEET TRANSPORT AND ALIGNMENT MECHANISM

James Alexander Craft, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1974, Ser. No. 482,310

Int. Cl.² B65H *9/04, 5/22*

U.S. Cl. 271—250 **4 Claims**



2. A pneumatic transport and aligner for transporting sheet material and aligning said sheet with an edge alignment guide comprising:

pneumatic propulsion means for aligning and transporting comprising a plurality of groups of nozzles;

each of said groups of said nozzles angularly oriented with respect to said edge alignment guide to progressively provide a decreasing translating vector and an increasing transporting vector of force on said sheet, with respect to its direction of transportation;

said plurality of nozzles pneumatically connected to a pressurized air source to provide continuous air flow therethrough.

3,918,707

DRIVE DEVICE FOR HOLDING PAPER ON A ROTATING DRUM

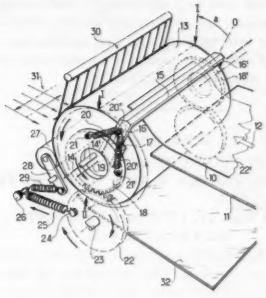
Jean Villemer, Paris, and Michel Landwerlin, Le Pecq, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 14, 1973, Ser. No. 397,334

Claims priority, application France, Sept. 14, 1972, 72.32620

Int. Cl.² B65H *5/12*

U.S. Cl. 271—277 **15 Claims**



1. A device for holding paper on a rotating drum, comprising drive means for continuously turning said drum about its axis, a crossbar disposed in parallel to the axis of said drum, rotatable mounting means for supporting said crossbar for movement in the radial direction of said drum between a position in contact with the surface thereof and an outer position spaced from said surface, said mounting means being rotated by said drum only when said crossbar is in contact with the surface of said drum, a toothed wheel engaging with said rotatable mounting means so as to be rotated thereby only when said crossbar is in contact with the surface of said drum, and cyclic control means connected to said toothed wheel for returning said crossbar to an initial position spaced from the surface of said drum subsequent to the initiation of rotation thereof.

3,918,708

OPTICAL ILLUSION PRODUCING AMUSEMENT DEVICE

Samuel A. Augusta, 3929 Carlan Ave., Lynwood, Calif. 90262

Filed Sept. 30, 1974, Ser. No. 510,500

Int. Cl.² A63H *33/22, 33/02*

U.S. Cl. 272—8 R **2 Claims**

1. An optical illusion producing amusement device that comprises:

a. a length of transparent resilient tubing that has first and second ends, said tubing deformed to define a circle with said first and second ends in abutting contact;

b. a cylindrical plug of such transverse cross section as to fit snuggly into the interior of said tubing when said first and second ends are in abutting contact, said plug having first and second transverse slots in first and second ends thereof; and

c. a light reflecting elongate ribbon having first and second sides of first and second different colors, said ribbon having first and second end portions, said ribbon disposed within said tube in a spiral defining configuration with said first and second end portions being gripped in said first and second slots as said plug concurrently serves to hold said first and second ends of said tubing in said abutting contact, and said device when rotated assuming a third color intermediate said first and second colors to provide said optical illusion due to the concurrent rotation of said ribbon with said tubing.

3,918,709

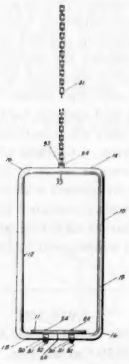
PLAY SWING APPARATUS

Daniel G. Bishop, P.O. Box 4, 19 S. Center St., Flora, Ind. 46929

Filed Sept. 11, 1974, Ser. No. 504,974

Int. Cl.[2] A63G 9/00

U.S. Cl. 272—85 **7 Claims**



1. A swing apparatus consisting essentially of:

a. an approximately rectangular support means sized appropriately for one child to stand or sit in and having a single point of attachment positioned at the center of one short side of said approximately rectangular support means, said support means being made using tubular metal;

b. chain means connecting said support means to a stationary point and including along its length a swivel joint to allow unrestricted rotation about an axis along a line between said stationary point and said single point of attachment;

c. means for maintaining said support means and said chain means at a sufficient height above the ground to allow free movement of said support means; and

d. a seat fixedly attached to the short side of said approximately rectangular support means opposite said single point of attachment.

3,918,710

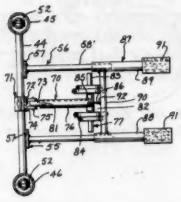
ROWING LEVER EXERCISE APPARATUS

Frank J. Niebojewski, 965 Tower Hill Drive, Brookfield, Wis. 53005

Division of Ser. No. 346,168, March 29, 1973, Pat. No. 3,874,657, which is a continuation-in-part of Ser. No. 294,975, Oct. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 43,337, June 4, 1970, abandoned. This application Aug. 12, 1974, Ser. No. 496,880

Int. Cl.[2] A63B 13/00

U.S. Cl. 272—81 **3 Claims**



1. A rowing lever exercise device comprising an inner pivotal mounting means for releasable attachment to a bar, a support shaft projecting outwardly from said pivotal mounting means, for pivotal mounting of said shaft on said bar, an extension member releasably secured to said shaft in any one of a plurality of positions along the axis of said shaft, said extension member extending lengthwise along said axis and being so mounted on said shaft so that as said extension member is moved along said shaft, the combined length of said shaft and said extension member is varied and a weight means secured to the end of said extension member outermost from said pivotal mounting means and having operating handles extending laterally to the opposite sides of the extension member adjacent said outermost end of the extension member.

3,918,711

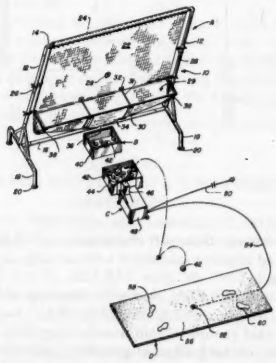
TENNIS TRAINING BALL TARGET AND PROJECTOR

Thomas J. Zak, 2251 S. 18th Ave., Broadview, Ill. 60153

Filed Jan. 14, 1974, Ser. No. 432,948

Int. Cl.[2] A63B 61/00

U.S. Cl. 273—29 A **1 Claim**



1. A non-rebound tennis trainer assembly, including

a substantially upright frame member, said frame member having side, top and bottom edges and bottom foot frame members to support said frame member,

a substantially inelastic, flexible sheet material having sides, top and bottom edges,

substantially inelastic means mounting said sheet material to said frame member so that the plane of the sheet material is positioned to intercept a driven tennis ball,

said sheet material and frame member being inclined in a direction opposite to the direction of a driven tennis ball to facilitate said tennis ball dropping into an elongated trough member after impact with the sheet material,

said trough member having its length located along the bottom edge of the sheet material and extending to opposite side edges of said sheet material so that a tennis ball drops into the trough member following impact with said sheet material, the width of said trough member being substantially less than the height of said frame member, a point in said trough member located substantially lower than the ends thereof and at the mid-portion of said trough member,

a ball discharge opening at said point, and

collecting means for tennis balls positioned below said ball discharge opening, a selectively positionable foot mat having fore-hand and back-hand stroke feet placement indicia on one side thereof for a righthand player and forehand and backhand stroke feet placement indicia on its reverse side for a left-hand player, said foot mat being placed a substantial distance from the ball impact side of said sheet material,

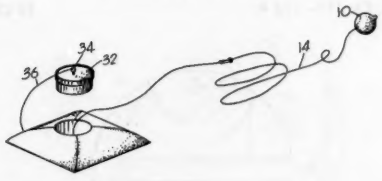
a tennis ball projecting device, said ball projecting device being freely movable and selectively positionable at different positions between said sheet material and said foot mat to project balls at a fixed trajectory towards said mat to be hit by a player and to vary the bounce height of the ball as it reaches the foot mat.

3,918,712

TETHERED BALL

William S. Fey, North Babylon, N.Y., and Robert J. Fey, Roseburg, Oreg., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1975, Ser. No. 547,747
Int. Cl.² A63B *43/02*
U.S. Cl. 273—58 C **3 Claims**



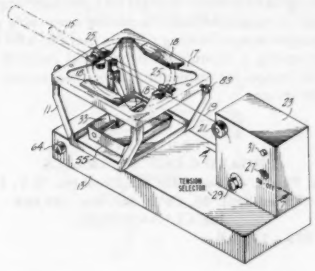
1. A tethered ball assembly which comprises: a ball, rubber membrane surrounding said ball, an elastic line secured to said rubber membrane, an anchor secured to the other end of said elastic line, an arcuate slot disposed in said rubber membrane, said arcuate slot being located diametrically opposite the point of attachment of said line to said membrane and dimensioned and configured for selective passage of said ball in and out of said rubber membrane and also to prevent inadvertent passage of said ball out of said rubber membrane.

3,918,713

RACKET STRINGING MACHINE

Bernard Kaminstein, 329 Franklin Place, Paramus, N.J. 07652

Filed Mar. 15, 1974, Ser. No. 451,428
Int. Cl.² A63B *51/14*
U.S. Cl. 273—73 A **13 Claims**



1. A racket stringing machine comprising:

a turntable for supporting and rotating a racket to be strung in a given plane, said turntable including means for clamping said racket thereto;

capstan means disposed for receiving and tensioning a string being strung on said racket;

means for establishing a value of a tension desired to be applied to said string by said capstan means,

means for rotatiang said capstan means in a direction to increase the tension applied to a string received thereon; means responsive to said string reaching said desired value of tension for deenergizing and energizing said means for rotating said capstan means to incrementally loosen and tighten said string; and

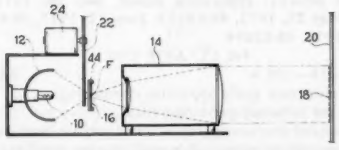
means for clamping the segment of the string tensioned by the said capstan means at a point proximate the interior side of the rim of the racket on the edge of the racket face closer to said capstan means for maintaining the tension on the segment of said string within the rim of the racket when the string is removed from said capstan.

3,918,714

FREQUENCY RESPONSIVE LIGHT TARGET

Luciano Ceccaroni, 91, Via Monte Venanzio, Ancona, Italy

Continuation of Ser. No. 243,603, April 13, 1972, abandoned. This application May 16, 1974, Ser. No. 470,525
Int. Cl. F41j *5/02*
U.S. Cl. 273—101.1 **1 Claim**



1. A simulated target-shooting apparatus having a light source adapted to be projected upon a screen and a means within a simulated gun adapted to receive a light signal projected upon the screen from the light source, comprising

a. a target screen,

b. a target image adapted to be projected by the light source upon said target screen and emitting a modulated signal having a preset frequency upon said target screen,

c. a photo-electric cell contained in a simulated gun and adapted to be directed upon said screen to receive said modulated signal and to be activated thereby,

d. a detector means in circuit with said photo-electric cell and receiving therefrom a signal pulse identical to said preset frequency modulated signal projected from said signal source onto said screen and received by said photo-electric cell,

e. and a hit target indicator in circuit with said detector means and adapted to be energized by a signal pulse from said detector means when the latter receives a signal pulse from said photo-electric cell so as to interrupt said light signal to indicate a target hit upon said target screen,

f. said hit target indicator including a movable plate having target-image-forming orifices therein, with said plate intercepting a modulated light signal emitted from the target image for projecting upon the screen different target images.

3,918,715

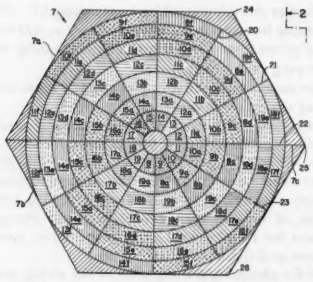
BOARD GAME APPARATUS

George S. Puglis, 45 Bay 19th St., Brooklyn, N.Y. 11214

Filed Sept. 20, 1973, Ser. No. 399,068

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—131 AB **2 Claims**



1. A game apparatus comprising in combination: a playing board having a playing pattern with color areas arranged substantially as shown in FIG. 1 of the drawing, and at least two separately identifiable sets of playing-pieces, each set having a plurality of separately identifiable playing-pieces.

3,918,716

GAME APPARATUS FOR TRYING COINCIDENCE BETWEEN RANDOMLY SELECTED CHARACTERS

Hiroshi Nonaka; Kikuo Usugi; Masataka Okada, and Shoji Iwasaki, all of Toda, Japan, assignors to Clarion Company Limited, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,226

Claims priority, application Japan, July 20, 1972, 47-72021; May 25, 1973, 48-60723; June 12, 1973, 48-65453; June 5, 1973, 48-62499

Int. Cl.[2] A63F *8/00*

U.S. Cl. 273—138 A **8 Claims**

1. An electronic game apparatus comprising:

means for initiating game operation;

a plurality of timers responsive to said game initiating means for providing electrical signals having predetermined different time durations;

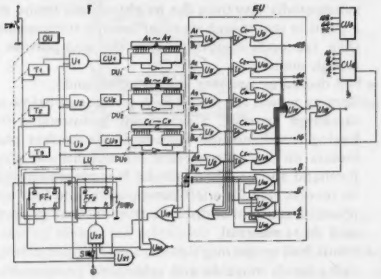
means also responsive to said game initiating means for providing an output signal consisting of a series of pulses;

a plurality of gate circuits, each responsive to a different timer signal and to said pulse signal, for passing said pulses when said timer signals are present;

a plurality of counter circuits, each coupled to a respective gate circuit, for counting the pulses delivered from each of said gate circuits respectively;

a plurality of display sections, including respective driver circuits, each display section responsive to a corresponding counter circuit respectively, each display section including means for exhibiting a character randomly selected from a closed set of different characters and dependent upon the termination of a corresponding timer signal, said driver circuits being so connected to said exhibiting means that the probability of selection of each of the characters differs;

a coincidence circuit for sensing the characters exhibited by said display sections and for producing a plurality of outputs corresponding to said characters being in predetermined patterns of coincidence, and probability of occurrence of said coincidence patterns differing;



prize chip dispensing means having a reservoir of prize chips and responsive to the outputs of said coincidence circuit for dispensing a predetermined amount of prize chips corresponding to each of said outputs of said coincidence circuit; and

a plurality of selector means adapted to be set prior to game operation being connected between said driver circuits and said display sections for changing the connections between driver circuits and exhibiting means so that the probability of selection of each of the characters is changed resulting in a corresponding change in the probability of occurrence of said coincidence patterns and, correspondingly, the amount of prize chip dispensation.

3,918,717

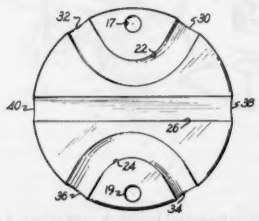
GAME APPARATUS

Virginia A. Charves, 142 John St., East Providence, R.I. 02914

Filed Nov. 27, 1974, Ser. No. 527,543

Int. Cl. A63f *9/00*

U.S. Cl. 273—138 R **10 Claims**



1. Game apparatus comprising

a rotatable base member having an outer surface,

the surface formed with a plurality of pairs of holes therein;

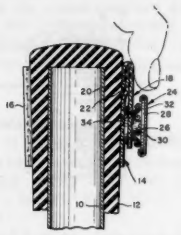
a channel formed in the base member extending therethrough between the holes of each respective pair, and

a plurality of player members adapted to movably fit within the channels.

3,918,718
GOLF CLUB AND BALL POSITION MARKER

Kathryn S. Billow, 102 Quinn, Severna Park, Md. 71146

Filed Sept. 23, 1974, Ser. No. 508,206
Int. Cl.² A63B 53/00, 57/00
U.S. Cl. 273—162 D 5 Claims

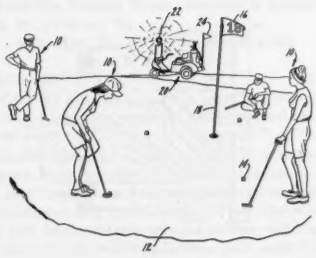


1. In combination, a golf club handle and a ball position marker carrier comprising a flexible sleeve member open at both ends, at least a part of which is stretchable elastic band material, said flexible sleeve member encircling said handle and having an unstressed diameter less than that of the handle by an amount enabling said sleeve member to be manually expanded to a size greater than the handle so as to be slidable thereover and when released to elastically clasp said handle for releasable retention thereon, a panel of flexible non-elastic material attached to said band material along at least one edge thereof and in a position that said panel lies parallel to the side of the club handle, and a ball marker carrying on one side thereof a male snap fastener part, the female part of said fastener being carried by said panel in a position that when said marker is snapped thereon thumb space is provided on said panel clear of said marker, whereby said panel may be clamped against the side of said handle by a thumb to prevent stressing of said elastic material when said marker male part is unsnapped from said panel.

3,918,719
METHOD OF PLAYING GOLF UNDER CONDITIONS OF INSUFFICIENT LIGHT

Medard W. Welch, 1111 Sheridan Road, Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 462,655, April 22, 1974, abandoned. This application Sept. 3, 1974, Ser. No. 502,784
Int. Cl.² A63B 67/02, 57/00, 43/06
U.S. Cl. 273—176 R 5 Claims

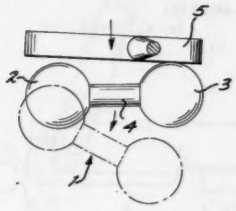


1. A method of using a golf course comprising the steps of playing a game of golf under conditions of insufficient natural light and using a fluorescent golf ball, a golf course including fluorescent markers, and a transportable light to illuminate the various playing locations on or adjacent the tees, greens and fairways, said golf ball including a fluorescent material on the outer surface thereof, and said markers including fluorescent flags on the pins located in the holes on the greens, and fluorescent rims extending around the putting cups in said holes.

3,918,720
PUTTING TRAINER

Ambrose L. Gordos, 4301 E. 2nd St., Apt. 1E, Long Beach, Calif. 90803

Filed Mar. 22, 1974, Ser. No. 453,789
Int. Cl.² A63B 69/36
U.S. Cl. 273—183 C 1 Claim



1. In combination with a golf putter embodying a head that has an elongate striking surface of a first length, a putting training device for use with said putter, which putting training device includes:

a. a pair of laterally spaced spheres that are substantially the same size, weight and exterior appearance as a golf ball; and

b. a rigid elongate member which extends between said spheres and is aligned on the diameter thereof, said member having a transverse cross section less than that of said spheres, which member is of such length that the overall length of said device is not greater than said first length, with said training device rolling in a straight line on a surface on which it is supported only when both of said spheres are concurrently contacted by said striking surface.

3,918,721
GOLF CLUB SWING TRAINING DEVICE AND METHOD

John B. Trask, Jr., 31 Donelon Ave., New Orleans, La. 70123

Filed Dec. 19, 1973, Ser. No. 426,435
Int. Cl.² A63B 69/36
U.S. Cl. 273—186 A 13 Claims

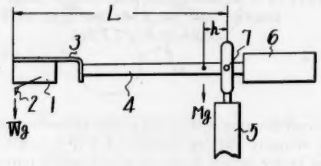
1. In a club swinging feeler device adapted to be attached to a golf club, which club is to be gripped in the hands of the user, with his hand overlying the club handle: sensate signal producing means, including an elongated feeler and means for attaching it to the club handle adjacent the hand grip, so that it can extend adjacent the arm of the user; the feeler being connected onto the attaching means, and the device having a shape and length to extend the feeler from the attaching means at the back side of the forearm of the user to lie adjacent the front side of the forearm of the user and to be in close relation but out of contact thereto when the user's wrists are held at a proper angle with respect to the club for a given position of swinging the club, the device providing a structure sufficiently rigid that it can maintain such predetermined

shape during the swinging of the club in a normal swing, and so that if the user's wrists become positioned at an improper angle with respect to the club, the forearm will contact the feeler and produce a sensate signal.

3,918,722
TONE ARM

Heitaro Nakajima; Hirotake Kawakami, both of Tokyo, and Shiyokichi Tatara, Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,449
Claims priority, application Japan, July 9, 1973, 48-81381; July 9, 1973, 48-81382
Int. Cl.² Q11B *3/10*
U.S. Cl. 274—23 R **9 Claims**

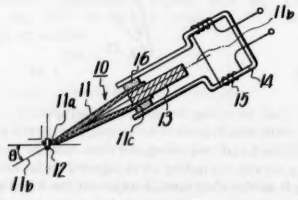


1. A tone arm for use with a phonograph, said tone arm being composed of fibers composed of carbon held in place by means of a resinous binder, said arm being elongated and having at one end a stylus mounted thereto and being pivotally mounted near the opposite end, said tone arm having a resonant frequency which does not coincide with the noise frequencies generated by eccentric records.

3,918,723
CANTILEVER FOR USE WITH PICKUP CARTRIDGE

Heitaro Nakajima; Hirotake Kawakami, both of Tokyo, and Shiyokichi Tatara, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,375
Claims priority, application Japan, July 9, 1973, 48-81383; July 9, 1973, 48-81384
Int. Cl.² G11B *3/02*
U.S. Cl. 274—37 **10 Claims**

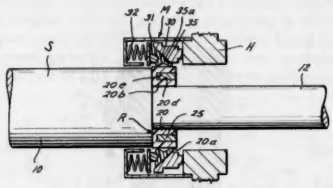


1. A cantilever for use with a phonograph pickup cartridge, said cantilever having a stylus attached to one end and a transducer attached to the other end, said cantilever comprising a body composed of carbon fibers held together with a resinous binder and having the properties of high rigidity and low mass to provide total frequency response characteristics.

3,918,724
SEAL FOR REPAIR OF A SHAFT OR THE LIKE

David W. Alley, 5917 Harbrook, Houston, Tex. 77017

Filed Nov. 28, 1973, Ser. No. 419,652
Int. Cl.² F16J *9/00*
U.S. Cl. 277—9 **6 Claims**



1. A seal device particularly adapted for sealing between a shaft and a mechanical seal wherein the shaft has two longitudinal portions of different outside diameters positioned longitudinally in sequence, with only one end of each portion adjacent to only one end of the other and with a radial shoulder therebetween, comprising:

a cylindrical layer of sealing material having an outer sealing surface adapted to contact said mechanical seal and an inner sealing surface in engagement with a smaller diameter portion of the shaft and a radial sealing surface for engagement with a radial shoulder between the two shaft portions of different outside diameters;

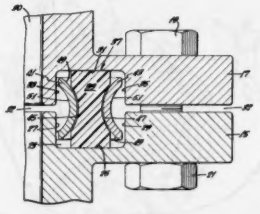
said cylindrical layer having a recess therewith radially outwardly of said inner sealing surface and axially of said radial sealing surface; and

a solid continuous ring of steel or the like in said recess and having an inner longitudinal bore surface which is greater in length than the radial thickness of the ring, with said bore surface extending longitudinally and axially substantially concentric with the surface of said smaller diameter portion of the shaft and also coextensively with said layer of sealing material.

3,918,725
CAPTIVE PLASTIC SEAL

Eldon O. Dryer, Malibu, Calif., assignor to W.S. Shamban & Co., West Los Angeles, Calif.

Division of Ser. No. 287,045, Sept. 7, 1972. This application June 17, 1974, Ser. No. 480,051
Int. Cl.² F16J *15/12*
U.S. Cl. 277—167.5 **5 Claims**



1. In combination:

first and second members defining an annular groove with said groove having axially spaced end walls and radially spaced circumferential walls;

a seal in said groove;

said seal including sealing ring means for circumscribing at least a portion of at least one of said members, an inner retainer ring, and an outer retainer ring;

said sealing ring means being constructed of a deformable sealing material and having inner and outer peripheral surfaces;

at least a portion of each of said retainer rings being concave in axial cross section with each of such concavities opening radially; and

said retainer rings each being independently resiliently deformable in the radial direction whereby upon axial compression and consequent radial expansion of the sealiNg ring means the retainer rings resiliently resist said radial expansion of the sealing ring means.

3,918,726

FLEXIBLE SEAL RING

Jack M. Kramer, 1942 Corning St., Los Angeles, Calif. 90034

Filed Jan. 28, 1974, Ser. No. 437,533

Int. Cl.² F16J *15/10*

U.S. Cl. 277—227 **13 Claims**

1. A flexible seal ring for forming a seal between two surfaces comprising:

a ring shaped elastomeric member, and

a ring shaped insert member embedded in said elastomeric member to provide reinforcement of the elastomeric member against deformation and resistance against abrasion, said ring shaped insert member being T-shaped in cross section and having at least a portion thereof which runs adjacent to one of the sealing surfaces of said seal ring and a stem portion extending from the first mentioned portion towards the central portions of the elastomeric member.

3,918,727

ORTHOPEDIC PIN HOLDER

Alan K. Forsythe, Vashon, Wash., assignor to Hazleton Laboratories, Inc., Vienna, Va.

Filed Apr. 16, 1974, Ser. No. 461,305

Int. Cl.² B23B *31/12*

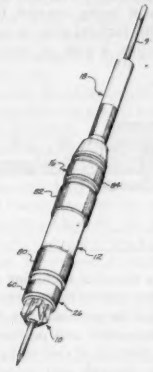
U.S. Cl. 279—50 **14 Claims**

2. A holder for holding long, thin objects comprising:

a plurality of jaws spaced about a longitudinal axis defined by said jaws;

preset means, mounted about said jaws so as to impinge on said jaws, for controlling the distance separating said jaws from said longitudinal axis, said preset means comprising an adjustment ring surrounding at least a portion of said jaws, and being rotationally adjustable with respect to said jaws about said longitudinal axis, said adjustment ring defining a plurality of sets of jaw impingement indentations, each of said sets including indentations equal in number to the number of said plurality of jaws, said indentations establishing chosen initial spacing positions between said jaws and said longitudinal axis, said indentations being oriented such that each jaw impinges on an indentation of the same set for each adjusted position of said adjustment ring; and,

gripping control means, operatively connected to said jaws and to said preset means, for causing said preset means to move said jaws toward and away from said longitudinal



axis, from the chosen initial spacing position established by said indentations.

3,918,728

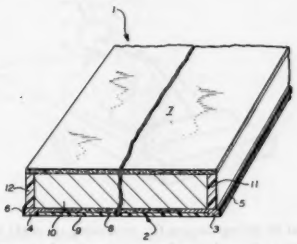
SNOW SKI AND EDGE

Walter F. Stugger, West Dover, Vt. 05356, and Arnold Sprung, 339 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Filed June 21, 1974, Ser. No. 481,942

Int. Cl.² A63C *5/04*

U.S. Cl. 280—11.13 E **8 Claims**



1. In a snow ski having a running bottom surface with longitudinal metal edges, the improvement which comprises a thin layer of 1–10 mils thickness of hard carbide particles of a particle size between about −100 mesh and +15 microns bonded to a lateral side of at least one of the metal edges and extending along a substantial portion of the length thereof, said layer being characterized by the inherent roughness and abrasive characteristics of such a layer of particles.

3,918,729

INTERLOCK DEVICE FOR SKATES

Shirley Peters, Haledon, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 10, 1975, Ser. No. 548,262

Int. Cl.² A63C *17/18*

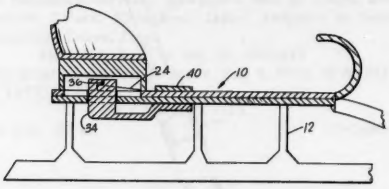
U.S. Cl. 280—11.3 **4 Claims**

1. A skate assembly comprising:

means for receiving the foot of a user, said means for receiving including a first elongated generally planar horizontal member having two apertures disposed at one end

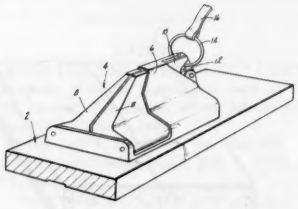
thereof, said apertures being elongated with a first longitudinal portion thereof being smaller than a second longitudinal portion,

a skate member having ground engaging means, said skate member including a clamp carried on an elongated arm, said elongated arm being carried for pivotal motion around a generally vertical axis on said skate member, said clamp including a pair of horizontally extending



fingers, said skate member including a second generally planar horizontal member having two upstanding studs with heads thereof larger than the body thereof, said heads being dimensioned and positioned to pass freely through said first portion of said elongated apertures and not to pass freely through said second portion thereof, said clamp being selectively pivotable for clamping engagement of said first and second generally planar members between said fingers.

3,918,730
SKI STOPPER
Hermann Schultes, Hohenems, Austria, assignor to Olin Corporation, New Haven, Conn.
Filed Nov. 29, 1974, Ser. No. 528,292
Int. Cl.² A63C 7/10
U.S. Cl. 280—11.13 B **12 Claims**



1. A ski stopping device for mounting on a ski having separate bindings for releasably securing the ski to a skier's boot, said device comprising:

a. braking means movable between a cocked position and a deployed position, said braking means being operable when in said deployed position, to stop the ski from sliding;

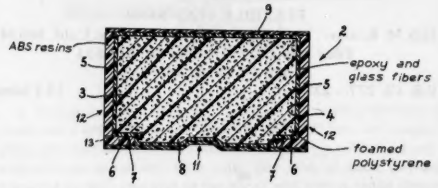
b. means operable to bias said braking means toward said deployed position;

c. searing means operable to releasably engage said braking means for retaining the latter in said cocked position;

d. first means including a closed loop for receiving a part of a strap which is secured to the skier's boot to form a releasable connection with the strap, said first means being operable to maintain connection between the strap and the device when the ski bindings have released the skier's boot in a static drop situation, and said first means further being operable to break connection between the strap and the device when the ski bindings have released the skier's boot in a dynamic release situation; and

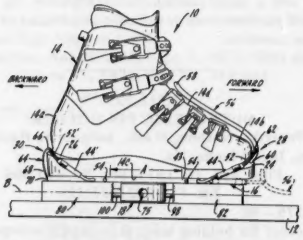
e. second means including a trigger operably connected to said first means for enabling disengagement of said searing means from said braking means only when said first means has broken the connection between the strap and the device, said trigger forming a part of said closed loop and being movable to a position opening the loop to free the strap of connection with the device.

3,918,731
CROSS-COUNTRY SKI
Maurice Legrand, Voiron, (Isere), France, assignor to Societe Anonyme Skis Rossignol, Voiron (Isere), France
Filed Feb. 5, 1975, Ser. No. 547,397
Int. Cl.² A63C 5/12
U.S. Cl. 280—11.13 L **6 Claims**



1. A cross-country ski comprising a core of cellular synthetic-resin material and having a pair of opposite lateral sides and top and bottom sides, a reinforced skin surrounding said core, a pair of L-section strips each having a vertical flange engaging and extending over a respective side wall and a horizontal flange extending partially under said bottom wall, a sliding layer on said bottom wall at least between said horizontal flanges and of lesser vertical thickness than said horizontal flanges, and a synthetic-resin layer on said top wall completely covering same and of substantially lesser thickness than said vertical flanges.

3,918,732
SAFETY BINDING FOR SKIS
Elmer B. Wulf, 17767 Baker, Country Club Hills, Ill. 60477
Filed Mar. 18, 1974, Ser. No. 451,972
Int. Cl.² A63C 9/08
U.S. Cl. 280—11.35 K **37 Claims**



1. In an improved binding for releasably attaching a ski boot to a ski, said binding having first connecting means secured to the boot, second connecting means secured to the ski, and means for releasably coupling said first and second connecting means together so that under predetermined load conditions the coupling means releases the connection between said connecting means in the forward, backward, lateral, or combination of directions,

the improvement wherein said coupling means includes

a. a pair of socket means disposed in a zone directly below the arch of the boot, with said socket means being in a fore-and-aft releationship generally along the length of the ski, each of said socket means being in one of the connecting means and displaced inwardly from the end of the boot to which it is proximate a distance equal to at least one-third the total length of the boot, and one of said

socket means serving as a fulcrum about which the leg may pivot in the lateral direction,

b. plunger means in the other connecting means adapted to engage at least one of the socket means, and

c. means normally urging said plunger means into engagement with the socket means, thereby coupling said connecting means, and under said predetermined load conditions, disengaging the plunger means from the socket means, thereby uncoupling said connecting means.

3,918,733

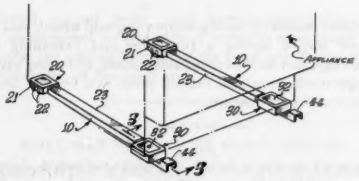
ARTICULATED APPLIANCE DOLLY

Jan M. Macho, La Canada, and Richard O. Oxford, Los Angeles, both of Calif., assignors to Dial Industries, Inc., Los Angeles, Calif.

Filed Sept. 23, 1974, Ser. No. 508,461

Int. Cl.[2] B62D *21/14*

U.S. Cl. 280—35 **2 Claims**



1. An appliance dolly of the type having a first horizontal load platform supported by a wheeled carriage adjustably spaced from a second horizontal load platform in combination with:

a truck having wheels rotably mounted to said truck,

means interconnecting said second load platform and said truck member for permitting relative rotation about a transverse axis said means including complimentary bearing surfaces consisting of a substantially horizontal surface on the lower side of said second load platform and one or more circular ribs concentric about said transverse axis on the upper surface of said truck.

3,918,734

COLLAPSIBLE STRUCTURE

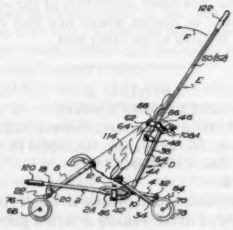
Angus Christopher Firth, and Frederick John Sheldon, both of Shipley, England, assignors to Lawrence Wilson & Son Limited, Yorkshire, England

Filed Mar. 4, 1974, Ser. No. 447,512

Claims priority, application United Kingdom, Dec. 18, 1973, 326/73

Int. Cl.[2] B62B *7/08*

U.S. Cl. 280—36 B **3 Claims**



1. In a collapsible structure of the type having

1. a pair of side frames, each side frame including two members pivotally interconnected intermediate their ends to form an X-like foldable frame, corresponding members of the two side frames being spaced apart and substantially parallel to each other in the erected state of the structure,

2. a bottom frame having two members connected intermediate their ends by pivotal means to form an X-like foldable frame, the bottom frame extending between the two side frames and being pivotally connected to the members thereof whereby folding of the members of the bottom frame is accompanied by folding of the members of the side frames, and

3. means for locking the structure in its erected state,

the improvement wherein the means for locking the structure in its erected state comprises

a. a latch bar extending between and attached to a member of each side frame,

b. a handle support pivotally connected to the pivotal means of the bottom frame whereby the handle support can be swung toward and away from the latch bar,

c. a handle pivotally secured to the handle support whereby the handle can be moved toward and away from the bottom X-like frame, and

d. a latch carried on the handle support, the latch being adapted to engage the latch bar to lock the structure in its erected state.

3,918,735

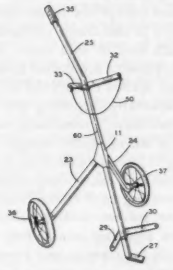
COLLAPSIBLE GOLF CART

Alan R. Denzer, Greenwich, Conn., and Edward F. Powers, Jr., Westfield, N.J., assignors to Zamax Manufacturing Co., Inc., Belleville, N.J.

Filed Nov. 18, 1974, Ser. No. 524,791

Int. Cl.[2] B62B *1/16*

U.S. Cl. 280—36 C **12 Claims**



1. A collapsible golf cart comprising:

a center member,

a tubular bag holder leg,

a right and left tubular wheel leg and a tubular handle member,

a hub at one end of said center member,

flexible elastic cords secured within said hub and within said legs and said handle member,

said hub having extensions cooperating with the tubular ends of said wheel legs and said bag holder leg to hold said wheel legs in outwardly diverging angular relation to and said bag holder leg in alignment with said center member, an axle for each of said wheel legs,

a bag retainer base plate pivotable outwardly from said bag holder leg,

said handle member having an extension at one end adapted to fit snugly within a tubular end of said center member, a wheel for each of said axles,

said elastic cords of a length to hold said legs and handle member under tension when in assembled relation with said hub and center member to permit said legs and handle member to be separated from said hub and center member and be folded together into a compact bundle.

3,918,736

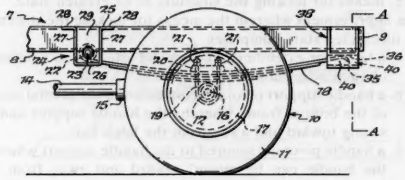
TANDEM AXLE SPRING SUSPENSION AND METHOD OF MAKING SAME

Albert F. Hickman, Eden, N.Y., assignor to Hickman Developments, Inc., Eden, N.Y.

Filed July 22, 1974, Ser. No. 490,815

Int. Cl.² B60G 5/06

U.S. Cl. 280—104.5 R **4 Claims**



1. A tandem axle spring suspension adapted to be interposed between a pair of tandem axles having rubber tired wheels journalled at the ends thereof, the forward of said axles being a drive axle provided with a central differential gear housing, drive shafts transmitting power through the differential gear to the companion pair of wheels, and brake means betweem the drive axle and its wheels, the suspension also including a walking beam arranged at each side of said frame and extending lengthwise thereof close to the inner vertical faces of the corresponding pair of tires, a horizontal cross rod extending transversely of said frame with its ends projecting beyond the sides of said frame toward the spaces between the tires, bearing means journalling said cross rod on the central parts of said walking beams, and means movably connecting each end of each walking beam with a corresponding axle end, wherein the improvement comprises means controlling movement of said axles relative to said frame comprising a cross rod bracket secured to each end of said cross rod and having upright faces facing in opposite directions fore-and-aft of the cross rod, frame bracket means connected to said frame and having upright faces severally opposing the corresponding faces of said cross rod brackets, a rectilinear movement shear rubber body secured at its opposite upright faces to each companion pair of upright faces of said cross rod brackets and said frame bracket means and each being distorted in upright shear in resiliently supporting each frame bracket on its cross rod bracket, said shear rubber bodies permitting vertical movement of said axles and also controlling the movement thereof horizontally both lengthwise and transversely of the line of vehicle movement, a single torque arm fixed to and projecting upwardly from one end only of said forward drive axle, a generally horizontal radius rod pivotally connected at one end to its upper end of said torque arm and extending lengthwise of the line of vehicle travel, and means pivotally connecting the other end of said radius rod to said frame, said single torque arm and radius rod at one end only of said forward drive axle forming the sole linkage means resisting brake and drive torque reactions of said forward drive axle.

3,918,737

WHEEL SUSPENSION FOR MOTOR VEHICLES

Rudolf Hofmann, Esslingen, and Herbert Klemmer, Hardt, both of Germany, assignors to Dr. -Ing. H. c. F. Porsche Aktiengesellschaft, Germany

Filed Apr. 30, 1974, Ser. No. 465,545

Claims priority, application Germany, May 5, 1973, 2322785

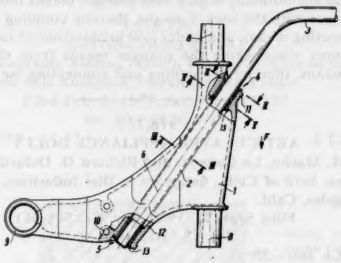
Int. Cl.² B62D 7/08

U.S. Cl. 280—124 B **18 Claims**

1. A suspension means for vehicle wheels comprising

guide means for pivotally supporting a wheel to a vehicle frame about a first pivot axis of said guide means, said guide means including an elongated bore extending therethrough along a second pivot axis substantially coplanar and intersecting with said first pivot axis,

first and second support means at opposite ends of said bore in said guide means, and



stabilizer means for spring-supporting said wheel, said stabilizer means having a free arm end extending freely through said bore of said guide means, and being pivotally supported along said second pivot axis by said first and second support means.

3,918,738

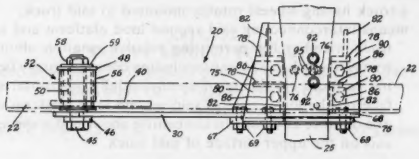
VEHICLE SUSPENSION ASSEMBLY WITH TORQUE PLATE

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed July 1, 1974, Ser. No. 484,761

Int. Cl.² B60G 11/24

U.S. Cl. 280—124 R **10 Claims**



1. A vehicle suspension comprising a flexible torque plate, means associated with the vehicle chassis for pivotally mounting the forward end of the torque plate from the chassis, means for mounting the rearward end of the torque plate to an axle of the vehicle, said torque plate being oriented to allow limited side flexing under vehicle loading, an elastomeric spring, and means for mounting the elastomeric spring between the axle and vehicle chassis near the rearward end of the torque plate, said torque plate being permitted to flex under side vehicle load subject to restraints imposed by said elastomeric spring, and being permitted to move in torsion about its longitudinal axis upon oscillation of the vehicle axle relative to the chassis as occurs where one end of the axle moves up or down relative to its other end.

3,918,739

VEHICLE SUSPENSION

Arthur C. Kirkland, 4015 Sturtevant, Detroit, Mich. 48204

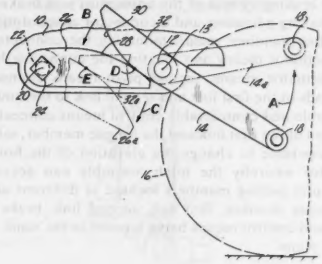
Filed Aug. 26, 1974, Ser. No. 500,417

Int. Cl.² B60G 11/20

U.S. Cl. 280—124 B **3 Claims**

1. A vehicle suspension comprising a single torsion bar non-rotatably anchored to the vehicle at a first point along its length; a force arm anchored to the torsion bar at a second point along its length to produce wind-up movements of the torsion bar for enabling said bar to resiliently absorb varying vehicle load forces; a road wheel arm mounted on the vehicle for deflecting movement around a swing axis in accordance with vertical displacement of the road wheel relative to the

vehicle; and motion-transmitting means between the road arm and force arm, whereby upward deflecting movement of the road arm causes the force arm to wind the bar at the aforementioned second point; said motion-transmitting means being constructed to produce a variable movement of the force arm per unit deflection of the road arm during the permissible stroke of the road arm.

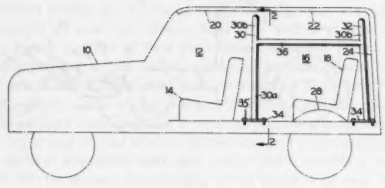


3,918,740

ROLL BAR STRUCTURE FOR VEHICLES

Richard L. Notestine, 6654 S. E. Flavel, Portland, Oreg. 97206

Continuation of Ser. No. 276,783, July 31, 1972, abandoned.
This application Feb. 25, 1974, Ser. No. 445,646
Int. Cl. B60r *27/00, 21/02*
U.S. Cl. 280—150 C **1 Claim**



1. A combination vehicle and roll bar structure therefor comprising

a. a front driver's compartment,

b. a rear passenger compartment comprising a bottom wall and a body portion defined by a top wall, side walls, and a rear wall,

c. a wheel housing projecting upwardly from and forming a part of the bottom wall on each side of said rear compartment,

d. a pair of transverse roll bars formed of metal tubing arranged to be mounted in the rear compartment of the vehicle with one of said roll bars disposed at the front of the rear compartment and the other disposed at the rear of the rear compartment,

e. said roll bars being of inverted U-shape, having upstanding leg portions and a connecting top portion,

f. each of said roll bars being bent into shape from a single length of tubing,

g. base plates on the bottom ends of said legs secured to the bottom wall of said rear compartment of the vehicle,

h. and a pair of longitudinally extending reinforcing bars connected to said leg portions of said two roll bars on respective sides at a point intermediate the upper and lower ends of said legs to form a rigidized roll bar assembly open at the front and rear from the top connecting portion to the base plates and also open at the top to allow head room for persons seated in the rear passenger compartment,

i. said legs of the roll bars being shaped to substantially follow the contour of the inner surface of said side walls,

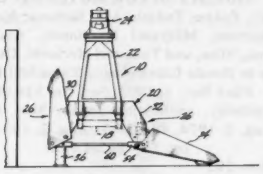
j. said base plates on each side being disposed one forwardly of the wheel housings and one rearwardly of the wheel housings.

3,918,741

DUAL MODE STABILIZER ASSEMBLY

John E. Olson, and Dennis W. Gaibler, both of Portland, Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Apr. 12, 1974, Ser. No. 460,334
Int. Cl.² B60S *9/12*
U.S. Cl. 280—150.5 **7 Claims**



1. A dual mode stabilizer assembly for a ground-supported vehicle having a frame, comprising p1 a support structure mounted on said frame,

ground-engaging means mounted on said support structure at one side of said frame and operable in a pair of alternatively selectable ground-engaging modes,

said ground-engaging means including a first member for engaging the ground at one location relative to said side of the frame upon operation in one of said modes, and a second member for engaging the ground at another location toward said side of the frame from said one location upon operation in the other of said modes,

means for selecting the operating mode of said ground-engaging means, comprising means for selective, alternative locking of said first and second members against movement relative to said frame, and

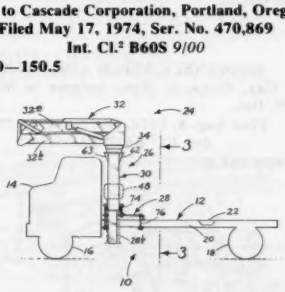
common powering means operatively connected to both of said members for shifting the unlocked one of the same into engagement with the ground according to the selected operating mode.

3,918,742

MATERIAL LOADER FRAME CONSTRUCTION

Dennis W. Gaibler, and John E. Olson, both of Portland, Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed May 17, 1974, Ser. No. 470,869
Int. Cl.² B60S *9/00*
U.S. Cl. 280—150.5 **6 Claims**



1. A modular frame construction for a boom-type material loader of a type adapted for mounting on a pair of generally parallel, longitudinally extending frame members comprising the chassis of a vehicle or the like, said construction including separate base and tower modules, wherein

said base module includes means for seating on the frame members of such a chassis and for accommodating releas-

able securing of the base module to the chassis, and means defining a pair of support platforms for demountably receiving and supporting said tower module, each of said platforms being disposed at a different elevation, and being displaced laterally of one another in the base module, and

said tower module comprises an elongate structure having upper and lower ends, and includes means adjacent the upper end thereof for carrying a load-handling boom assembly, and means adjacent the lower end thereof configured for selective releasable mounting on either of said support platforms.

3,918,743

SIDE-STAND FOR MOTORCYCLE

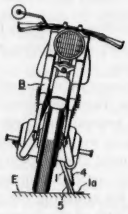
Minoru Sato, Tokyo; Tadashi Aso, Saitama; Kenichi Oonishi, Higashikurume; Mitiyoshi Hashimoto, Asaka; Tuneyasu Murayama, Niiza, and Tadanori Horiuchi, Ooi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Nov. 1, 1974, Ser. No. 520,003

Claims priority, application Japan, Nov. 16, 1973, 48-131706; Aug. 2, 1974, 49-92561; Aug. 2, 1974, 49-92562

Int. Cl.² B62H *1/06*

U.S. Cl. 280—293 **12 Claims**



1. A side-stand for a motorcycle which comprises in combination: a body of a motorcycle; a side-stand having a bent portion to be the contact surface with the ground surface, and movably fitted at one end part thereof to said motorcycle body; and an auxiliary member fitted to one side of said side-stand, said auxiliary member being such that, when the motorcycle is to be parked a part thereof is bent or collapsed by the weight of the motorcycle body, and, when the motorcycle is set upright to start running, the collapsed part stretches downward by its own resiliency or by an external elastic force to protrude beyond the contact surface of said side-stand to face the ground surface.

3,918,744

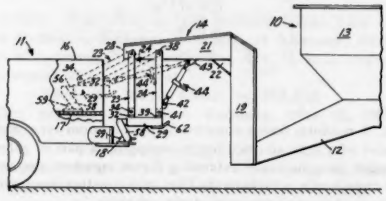
GOOSENECK HITCH ASSEMBLY

James E. Gay, Fargo, N. Dak., assignor to Mobility, Inc., Fargo, N. Dak.

Filed Aug. 8, 1974, Ser. No. 495,677

Int. Cl.² B62D *53/06*

U.S. Cl. 280—415 B **11 Claims**



1. A hitch assembly for coupling an apparatus having a braking system to a towing unit having a pulling member comprising: a forwardly directed tongue member attached to the apparatus, a first link having an upper and lower end, a second link having an upper end and lower end, first pivot means connecting the upper ends of the first link and second link to the tongue member, brake actuator means for controlling the braking system of the apparatus, said brake actuator means having a housing and a connector adapted to attach to the pulling member, means mounting the connector on the brake actuator means and locating the connector below the brake actuator means, second pivot means connecting the lower ends of the first link and second link to the housing, and expandable and contractable control means connected to the lower end of the first link and the tongue member, said control means operable to change the elevation of the housing and connector whereby the hitch assembly can accommodate towing unit pulling members located at different elevations, said tongue member, first link, second link, brake actuator means and control means being located in the same generally upright plane.

3,918,745

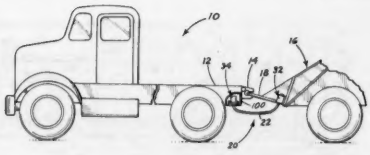
SAFETY CONNECTOR FOR TOWED VEHICLE

Raymond L. Smith, Cottage Grove, Oreg., assignor to Raymond L. Smith, Cottage Grove and Clifford L. Smith, Lacomb, both of, Oreg., part interest to each

Filed Feb. 21, 1975, Ser. No. 551,621

Int. Cl.² B60D *1/12*

U.S. Cl. 280—457 **9 Claims**



1. A safety connector for connecting a towing vehicle and a towed vehicle comprising

an elongate flexible member having an enlarged end portion at one end thereof of greater side-to-side dimension than other portions of said member adjacent said end portion,

a first holder secured to one of said vehicles including a socket having an interior chamber having a side-to-side dimension adapted to receive said enlarged end portion of said member therein, with one end of the chamber defining a seat for said enlarged end portion and the opposite end of the chamber being open to define an entrance aperture spaced from said seat for receiving said enlarged end portion, a restricted longitudinal slot extending through a side of said socket from the entrance aperture to said seat, said slot having a side-to-side dimension greater than said other portions of said member but less than said enlarged end portion for permitting passage of said member into said chamber,

keeper means shiftable between an open position spaced from said entrance aperture permitting insertion of said enlarged end portion into said chamber and a closed position extending across a portion of said entrance aperture inhibiting removal of said member from the socket, and

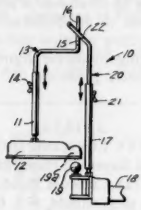
a second holder secured to the other of said vehicles for securing the opposite end of said flexible member to said other vehicle.

3,918,746

TRAILER AND TOWING VEHICLE COUPLER GUIDE

Lauri Lehtisaari, 6 Stewart Ave., Kapuskasing, Ontario, Canada (P5N 1S1)

Filed Nov. 15, 1974, Ser. No. 524,215
Int. Cl.[2] G01C 5/00; B60D 1/06
U.S. Cl. 280—477 1 Claim



1. A trailer and towing vehicle coupling facilitating guide comprising an elongated first sleeve means adapted to be secured to the trailer hitch portion at one end and slidably adjustably receiving an elongated sighting post means to protrude from its other end, a second elongated sleeve means adapted to be secured to the towing vehicle at one end and slidably adjustably receiving a sighting rod means to protrude from its other end, said rod means having a V-shaped upper end portion for sighting the upper end of said post means, each said first and second sleeve means provided with thumb screw means for securing the respective lower ends of said post means and rod means, said post means having a bright color coating at its upper extremity followed by a contrasting bright color coating therebelow to enable easy sighting of said post means within the confines of the apex of the V-shaped end portion of said rod means, said first sleeve means and mating lower portion of said post means adapted to extend vertically relative to the trailer, the upper portion of said post means including a horizontal portion adapted to extend forwardly relative to the trailer hitch to a position directly above the trailer hitch coupling and a vertical portion connected to the forward end of said horizontal portion and positionable to be in vertical alignment with said trailer hitch coupling, said second sleeve means and mating lower portion of said rod means adapted to extend vertically relative to the towing vehicle from a position adjacent but forwardly of the towing vehicle coupler, the V-shaped upper end portion of said second sleeve means being bent at an angle so as to be orientable to extend upwardly and rearwardly above said towing vehicle coupler in a position to receive the colored upper end portion of said post means within the confines of the apex of said V-shaped end of the rod means.

3,918,747

WELL SUSPENSION SYSTEM

Samuel W. Putch, Houston, Tex., assignor to Norman A. Nelson, Houston, Tex., a part interest

Filed Sept. 27, 1973, Ser. No. 401,510
Int. Cl. F16l 35/00
U.S. Cl. 285—4 17 Claims

10. In an assembly for connecting first and second tubular members to and from each other in a well by longitudinal movement of the first member, said first member including an annular recess in its peripheral surface adjacent the second member, a radially extending stop shoulder on the first member at each end of the recess, a resiliently expandable and contractible locking ring positioned in said recess and axially slidable thereon between said stop shoulders, locking means on the first member for locking said ring in an expandable position, a locking notch on the second member in its peripheral surface adjacent the first member for receiving the expanded and locked ring, the improvement comprising,

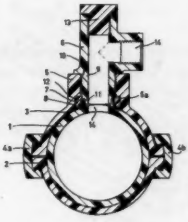
shearable holding means intermediate the ends of the locking ring which when sheared by downward longitudinal movement of the first member allows the upper portion of the ring to releasably lock the first and second members together, said shearable means includes a thin walled section in said locking ring.

3,918,748

BRANCH CONNECTION FOR THERMOPLASTIC PIPE

Petrus Marinus Acda, Enkhuizen, Netherlands, assignor to Polva Nederland B.V., Netherlands

Filed Sept. 12, 1974, Ser. No. 505,241
Claims priority, application Netherlands, Sept. 14, 1973, 7312742
Int. Cl.[2] F16L 41/04, 47/02
U.S. Cl. 285—21 3 Claims



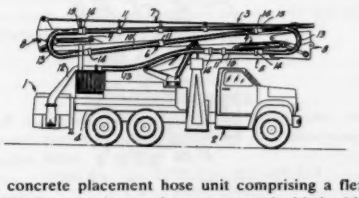
1. A branch connection for connecting a branch pipe to a main pipe made of a thermoplastic material, comprising a cylindrical tubular insert made of a thermoplastic material and having an end adapted for welding to the main pipe; a shell-shaped member arranged to fit about the insert and a portion of the main pipe; means for clamping the member to the main pipe; a branching member; means for connecting a branch pipe to the branching member; means for connecting the branching member to the shell-shaped member; and a sealing ring having an uncompressed annular thickness; wherein said insert has an inner cylindrical surface, and said branching member comprises a portion extending within said insert and having a radial clearance between the extending portion and the inner surface of the insert less than the uncompressed annular thickness of the sealing ring, the sealing ring being compressed between said extending portion and said inner surface.

3,918,749

CONCRETE HOSE AND COUPLING

Edward A. Taylor, Palos Verdes, Calif., assignor to Construction Forms, Inc., Cedarburg, Wis.

Filed Aug. 7, 1974, Ser. No. 495,506
Int. Cl.[2] F16L 33/00
U.S. Cl. 285—256 5 Claims



1. A concrete placement hose unit comprising a flexible rubber-like hose having a wire support embedded within a rubber-like body, said hose having a coupling end including said wire support and receiving an end coupling shank of a hardened material projecting into the coupling end of said hose and having an inner diameter corresponding to the unstressed inner diameter of said hose, comprising the improve-

ment wherein said wire support includes at least one wire-like element extending continuously through the coupling end and into the adjacent body, said continuous wire-like element being a hardened element within the adjacent body and a relatively soft, ductile element within the coupling end, said shank projecting outwardly of said hose, and a clamp means encircling the end of the hose in alignment with said hardened shank.

3,918,750

LOCKING DEVICES FOR DOORS

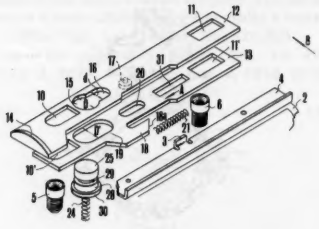
Hajime Okamoto, Kawasaki, Japan, assignor to Yashica Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,314

Claims priority, application Japan, Dec. 12, 1972, 47-142605

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—106 **6 Claims**



1. A locking device for a door adapted to close an opening of a casing comprising a latch, a linearly slidable member having a hook slidable along a linear path to engage in interlocking relationship with said latch, said latch being provided for one of said door and casing and said slidable member being provided for the other, biasing spring means to bias said slidable member longitudinally along a linear path in a direction for engaging said hook with said latch, manually operated means engaging said slidable member for longitudinally sliding said slidable member along the linear path in a direction opposite to that of the biasing spring means for releasing the latch, a manually operated locking member engageable with said slidable member for locking the slidable member against movement, and second biasing spring means for normally biasing said locking member into locking engagement with said slidable member.

3,918,751

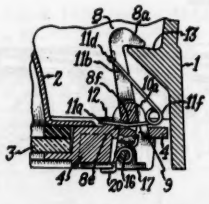
LATCH DEVICE

Walter R. Blake, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,758

Int. Cl.[2] E05C *19/12*

U.S. Cl. 292—126 **8 Claims**



1. A closure device comprising, in combination, a housing having an opening, closure means for closing said opening, and latch means for releasably securing said closure means to said housing comprising a catch on said housing, first bearing means on said closure means defining a bearing axis, a lever having opposite ends and having second bearing means intermediate its ends engaging said first bearing means for turning about said bearing axis, said lever having a hook portion at one end engageable with said catch, first spring means for urging said lever about said bearing axis for holding said hook portion in yieldable engagement with said catch, tab means pivotally secured to said lever at the other end thereof, said tab means being turnable to an operative projecting position engaging and forming an extension of said lever for operating the same and turnable to an inoperative retracted position away from said projecting position and disengaged from said lever, and second spring means for urging said tab means into said inoperative retracted position.

3,918,752

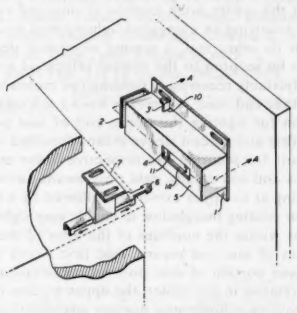
SAFETY LOCKING DEVICE

Adolph A. Leone, 800 Ravenhill Place, Ridgefield, N.J. 07657; Joseph T. Polese, 721 Carleton Road, and Richard Polese, 534 Hort St., both of Westfield, N.J. 07090

Filed Apr. 11, 1974, Ser. No. 459,880

Int. Cl.[2] E05C *17/08*

U.S. Cl. 292—174 **1 Claim**



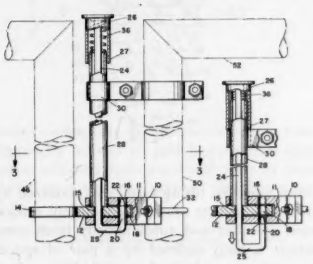
1. In a safety locking device for restraining the opening of enclosures having doors, drawers, panels and the like, having a safety detent means attached to the enclosure arranged to coact with the safety latching means attached to the openable portion of said enclosure, which coaction permits partial opening of the enclosure, unlocking means arranged as a portion of said safety latching means, which unlocking means is reachable from outside the enclosure through said partial opening, whereby predetermined manipulation of said unlocking means disengages the safety detent means and permits complete opening of the enclosure access means, the improvement wherein the safety latching means comprises a backplate portion arranged to securely attach to the openable portion of the enclosure; a cover means securely attached to the said backplate portion; an interlocking slide latch member having a latch key opening therein and which interlocking slide latch member is arranged within said cover means with a portion thereof extending beyond said cover means and arranged to be manipulable from the outside of said cover means; at least one safety interlock member arranged to coact with the latch key opening portion of said interlocking slide latch member enclosed within said cover means with a manipulable portion of said safety interlock member arranged outside of said cover means; a floating slide latch member arranged within said cover means having an opening therein for receiving and engaging said slidable detent member which floating slide latch member coacts with a portion of said interlocking slide latch member such that a predetermined manipulation of both the safety interlock member and the interlocking slide latch member permits the interlocking slide latch member to coact with said floating slide latch member to release engagement of said floating slide latch member from said detent member; and

bias means arranged to return the safety interlock member, interlocking slide latch member and the floating slide latch member to their initial coacting positions to effectuate resetting of the safety latching mechanism.

3,918,753
AUTOMATIC GATE LATCH

Donald H. McCormack, El Cajon, and James E. Svab, San Diego, both of Calif., assignors to Frank Eugene Northcutt, El Cajon, Calif.

Filed Mar. 15, 1974, Ser. No. 451,446
Int. Cl.² E05C *3/26*
U.S. Cl. 292—216 **8 Claims**



1. A self-latching yoke gate latch for releasably latching a hinged gate relative to a fixed fence comprising:

a latch body having a bearing for rotatably mounting a latch yoke on a vertical axis,

said latch body having a vertical bore horizontally spaced from the axis of said bearing for receiving a latch pin,

said latch body including mounting means for securing said latch body on a first vertical support,

said latch yoke being carried on said latch body for pivotal movement relative thereto on said bearing between gate latched and gate unlatched positions and having a vertical latch bore spaced from said bearing axis,

said latch bore aligning with said vertical bore when said gate is in said gate latch position,

resilient means for biasing said latch pin toward said latch yoke,

a latch pin actuator means for withdrawing said latch pin from said latch bore,

said latch pin actuator means comprising a latch operator's handle accessible only at a location vertically spaced from said latch body,

a latch actuator tube enclosing said latch pin actuator means between said latch operator handle and said latch body,

a bracket supporting said latch actuator tube from said first vertical support,

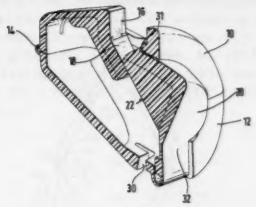
said said latch operator's handle including a depending flange arranged to engage the upper surface of said bracket.

3,918,754
PLASTICS FASTENERS

Stephen W. Isbister, Maidenhead, England, assignor to ITW Limited, Slough, England

Filed Apr. 23, 1975, Ser. No. 570,885
Claims priority, application United Kingdom, Apr. 26, 1974, 18446/74
Int. Cl.² E05C *3/08*
U.S. Cl. 292—224 **8 Claims**

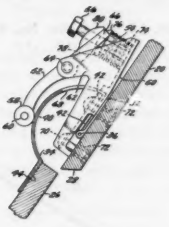
1. A latch unit formed in one-piece of a resiliently flexible plastics material and comprising two body portions which are hinged to one another, and which are further hinged to a latch and a button respectively, the arrangement being such that the body portions can be folded to a position in which they can be inserted into and held by an aperture in a panel, manual actuation of the button then causing movement of the latch from an operative position to an inoperative position.



3,918,755
HOLD-OPEN LATCH ASSEMBLY

Dennis E. Murphy, Costa Mesta, and Larry David Smith, Westminster, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed June 7, 1974, Ser. No. 477,201
Int. Cl.² E05C *19/02*; E05D *11/08*
U.S. Cl. 292—256 **8 Claims**



1. A latch assembly in combination with:

a hinge having an anchor leaf, pintle and swinging leaf,

said swinging leaf comprising a radially straight shoulder portion extending from said pintle and terminating in an arcuate portion having its radius substantially the same as the length of said shoulder portion, said arcuate portion terminating in a means to which a door may be mounted, said latch assembly comprising a base, an arm pivotally mounted on said base, said arm having one end engaging the surface of said arcuate portion when said hinge is in closed position and engaging said shoulder portion when said hinge is in open position,

said arm having a rear end opposite said one end and a pivotal connection with said base intermediate said ends, and

a compression spring between said rear end and said base to retain said one end of said arm against said shoulder portion when said hinge is in open position.

3,918,756
WAFER HOLDER

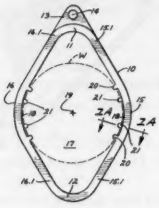
Russell H. Saville, Minnetonka, and Douglas M. Johnson, Carver, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Dec. 26, 1973, Ser. No. 427,454
Int. Cl.² B05C *13/02*
U.S. Cl. 294—31.2 **15 Claims**

5. A holder for carrying and manipulating silicon wafers for processing, comprising:

a plastic frame of substantially rigid material but flexible under significant applied force, the frame having an open

interior to receive such a wafer, the frame having opposite wafer-cradling side portions and lugs thereon projecting into said open interior to confine the wafer, the side portions being forcibly displaceable outwardly to release

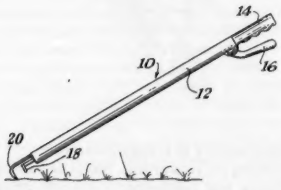


the wafer, the peripheral surface around the open interior being unobstructed in directions along and transverse to the periphery and between the lugs to permit free drainage of liquid from the wafer.

3,918,757
WEED PULLER

Frank J. Huber, 6840 S.W. 8th St. Apt. F613, Miami, Fla. 33144

Filed Feb. 11, 1974, Ser. No. 441,414
Int. Cl.² A01B *1/18*
U.S. Cl. 294—50.9 **1 Claim**

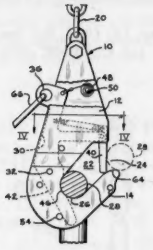


1. An improved weed puller comprising:
an elongated rigid hollow shaft having a first end and an opposite end;
a handle connected to said shaft first end;
a linkage arm disposed substantially inside said hollow shaft, resiliently connected at one end to said first end of said shaft, said linkage arm having a short protruding portion disposed outside of said shaft opposite end;
at least two parallely disposed, separated, L-shaped prongs connected to said opposite end of said shaft, said prongs being substantially perpendicular to the longitudinal axis of said shaft;
a flat, rigid plate perpendicularly connected to the end of said linkage arm protruding from said inside of said shaft; a lever pivotally connected to the first end of said shaft adjacent said handle and connected to said linkage arm for moving said linkage arm;
a spring resiliently connecting said linkage arm to the first end of said shaft, said spring being disposed within said shaft; and
a means for moveably adjusting the distance separating said prongs, said prongs having surface portions facing said flat plate which are substantially flat whereby pivoting said lever moves said linkage arm from the first position out of engagement with said flat pronged surface portions to a second position in engagement with the flat portion of said prongs.

3,918,758
REMOTELY RELEASABLE SELF-LATCHING SNAP HOOK

Paul J. E. Fournier, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed July 18, 1974, Ser. No. 489,840
Int. Cl.² B66C *1/38*
U.S. Cl. 294—83 R **3 Claims**



1. A snap hook for lifting loads characterized by economy of construction and its ability to remotely release the load attachment member and automatically latch comprising, in combination, a body defined by a pair of spaced, parallel plates, support means defined on said plates, a hook opening defined in said plates for receiving a load attachment member, said hook opening having a load-bearing portion and an open throat for receiving a load attachment member, a load attachment member release lever pivotally mounted intermediate said plates for movement between load release and latched positions, said lever having a load attachment engageable portion movable through said hook opening from said load-bearing portion toward said throat during load release movement, a lanyard attached to said lever for moving said lever from said latched position to said load release position to lift a load attachment member from said hook opening, spring means located between said plates biasing said lever toward said latched position, a load attachment member keeper mounted on said lever closing said hook opening throat when said lever is in said latched position and removed from said throat when said lever is in said load release position, said keeper comprising a finger pivotally mounted upon said release lever movable between a throat-closing position and a load attachment member bypass position when said release lever is in said latched position, a nose defined on said body adjacent said open throat extending outwardly beyond said hook opening and defining a load attachment positioning surface on said body on the opposite side of said keeper with respect to said hook opening load bearing portion when said keeper is in said throat closing position and prior to said keeper being displaced by a load attachment member during loading of the hook.

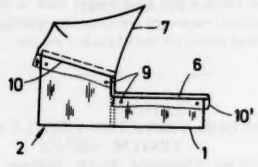
3,918,759
BABY CARRIAGE

Georg Gesslein, Krs. Lichtenfels, 8621 Mannsgereuth, Germany

Division of Ser. No. 188,846, Oct. 13, 1971, Pat. No. 3,799,606. This application Nov. 27, 1973, Ser. No. 419,408
Claims priority, application Germany, Oct. 14, 1970, 7037990[U]
Int. Cl.² B62D *29/04*
U.S. Cl. 296—28 B **2 Claims**

1. In a baby carriage of the type having a body adapted to be supported on a wheeled carrier having a handle, wherein said body has a bottom and head, side and foot walls defining a cradle for accommodating a baby in belly-down position with its head adjacent said head wall; the improvement wherein said body is a unitary trough of transparent material,

said transparent material extending to the upper edge of said body without intervening opaque portions, said body having a curved end carrying adjustable opaque covering means mounted on said body for selectively screening portions of said transparent body at said curved end thereof, said opaque



covering means comprising an opaque screening hood pivotally and removably affixed to said body at the upper edge thereof to cover selected portions of said body by moving said screening hood to a selected pivoted position around said curved end.

3,918,760

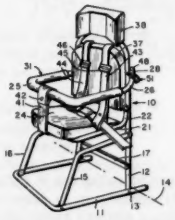
GUARD RAIL SAFETY LOCK

Morris I. Goldberg, 39 Locke Road, Newton, Mass. 02168

Continuation of Ser. No. 235,242, March 16, 1972. This application Sept. 9, 1974, Ser. No. 504,370

Int. Cl.² A47C *1/08*

U.S. Cl. 297—384 **2 Claims**



1. In an infant's car seat of the type having a guard rail pivotally mounted at each end to the corresponding side of the side frame of said seat to rotate between a lowered waist-encircling position and a raised position above the seat and wherein that portion of the guard rail adjacent each said pivot is oriented generally parallel to the corresponding side of the side frame when the guard rail is in its lowered waist-encircling position, a safety lock to optionally retain said guard rail in said lowered position, said safety lock comprising a U-shaped member pivotally mounted to the side frame of said seat at right angles to and below said guard rail pivot, said U-shaped member having side arms adapted to closely overlie said guard rail when both said guard rail and said safety lock are in lowered position and of a length to permit the cross-bar portion of said U-shaped member to clear the end of said guard rail to permit said safety lock to be raised about its pivot to a raised position free from said guard rail.

3,918,761

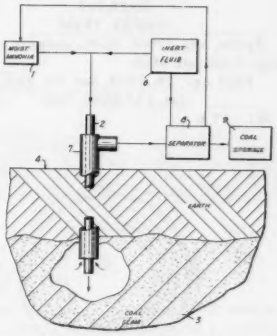
CHEMICAL COMMINUTION OF COAL AND REMOVAL OF ASH INCLUDING SULFUR IN INORGANIC FORM THEREFROM

Robert G. Aldrich, Manilius, N.Y., assignor to Syracuse University Research Corporation, Syracuse, N.Y.

Division of Ser. No. 442,559, Feb. 14, 1974, Pat. No. 3,870,237. This application Sept. 30, 1974, Ser. No. 510,854

Int. Cl.² B02C *19/00*; **E21C** *41/04*

U.S. Cl. 299—5 **8 Claims**



1. A method of mining coal comprising the steps of injecting into a stratum of coal an effective amount of moist ammonia where the ratio of water to ammonia is up to 72:28 by weight, injecting an inert fluid into the region of said stratum of coal treated with said moist ammonia at a rate high enough to form a suspension of coal particles in said inert gas, and leading said suspension of coal particles in inert gas to the atmosphere for collection of said coal particles.

3,918,762

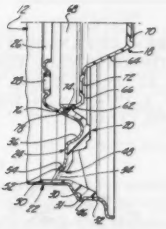
VEHICLE WHEEL COVER

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 29, 1974, Ser. No. 455,994

Int. Cl.² B60B *7/00*

U.S. Cl. 301—37 P **27 Claims**



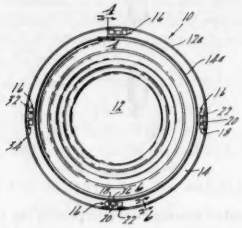
1. A cover for a vehicle wheel with a metal rim adapted to receive a tire thereon fixed to a metal disk having a bolt circle with a plurality of bolt mounting holes extending generally axially through the disk and a plurality of lugs on said disk, said cover comprising a homogeneous body of a resilient elastomer material having an inboard face contoured for contact with the outboard face of the disk, said body having a plurality of homogeneously integral pockets adapted to yieldably snap into engagement with the lugs of the disk to mechanically retain said body of said cover on the vehicle wheel, said body having an outboard face exposed to view

from the outboard side of the wheel and spaced axially of the wheel outboard from said inboard face of said body, said outboard face of said body having a contour differing from the contour of the covered part of the outboard face of the disk and adapted to provide a decorative contour over at least part of the wheel, said body having a central aperture therethrough encircling the bolt mounting holes of the disk when said cover is received on the wheel, said cover also comprising a center cap overlying said central aperture and removably carried by said body.

3,918,763
WHEEL TRIM

Frank L. Harris, Ann Arbor, Mich., assignor to Norris Industries, Inc., Ypsilanti, Mich.

Filed Apr. 29, 1974, Ser. No. 465,290
Int. Cl.² B60B 7/06
U.S. Cl. 301—37 B **15 Claims**

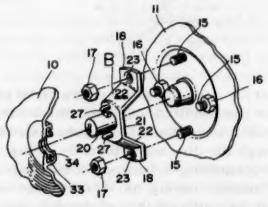


1. A wheel trim assembly for disposition on the axially outer face of a vehicle wheel, comprising in combination: a cover member for covering at least a portion of the axially outer face of a vehicle wheel; a one-piece annular retention band member disposed on the axially inner face of said cover member; a plurality of spaced individual spring retention clips disposed about the axially inner face of said retention band member for removably mounting the wheel trim assembly on a vehicle wheel; integral positioning means bent out of said band member for restraining said clips against movement with respect to said band member in a circumferential direction and in a radially inwardly direction; and flange means on said cover member for rigidly securing said spring retention clips to said retention band member and said retention band member to said cover member.

3,918,764
COMBINED LOCK BRACKET AND WHEEL COVER FOR AUTOMOTIVE VEHICLES

Robert E. Lamme, 41 E. 19th St., Hialeah, Fla. 33010

Filed Nov. 1, 1974, Ser. No. 520,108
Int. Cl.² B60B 7/00
U.S. Cl. 301—37 AT **3 Claims**

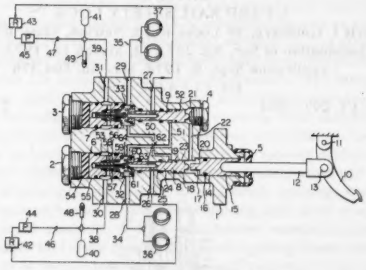


1. A combined lock bracket and wheel cover for automotive vehicles comprising bracket means having a base member, a plurality of inclined leg portions extending from said base member at substantially an obtuse angle, a flange extending outwardly from the free end of said inclined leg portions, said flanges lying substantially parallel to said base member, bores in said flanges for receiving lugs mounted on said automotive vehicle, said base member having a centrally disposed opening, a barrel lock having a retractable latching mounted in said opening and extending in a direction away from said bracket means, a wheel cover having a centrally disposed opening receiving said barrel lock, means mounted on said wheel cover engaged by said latch when said barrel lock is in a locked position and further means preventing the rotational movement of said wheel cover on said bracket means.

3,918,765
PRESSURE CONTROL VALVE FOR VEHICLE BRAKING SYSTEM

Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Apr. 17, 1974, Ser. No. 461,591
Claims priority, application Japan, Apr. 17, 1973, 48-43361
Int. Cl.² B60T 13/00
U.S. Cl. 303—6 R **3 Claims**



1. A pressure control valve for use in a dual circuit braking system for a vehicle comprising: a valve body having two stepped bores therein, a stepped piston slidably received in each of said stepped bores, an annular space defined between each of the stepped bores and stepped pistons received in said stepped bores, a pressure space defined respectively in each of said bores, each pressure space being communicated with at least one wheel cylinder of one of said braking circuits, valve means disposed in each of said pressure spaces for selectively connecting each of said pressure spaces with a source of hydraulic fluid under pressure and with a reservoir, a positively actuated piston disposed in one of said stepped bores coaxially with one of said stepped pistons and defining a fluid space with said stepped bore and said stepped piston, said positively actuated piston adapted to pressurize hydraulic fluid confined in said fluid space, said stepped pistons each having an end exposed in each of said pressure spaces and axially slidable therein for engaging said valve means and for actuating said valve means to connect one of the pressure spaces with the source of hydraulic fluid under pressure, and a passage permanently connecting one of the pressure spaces in one of said stepped bores to the annular space in the other stepped bore, to cause increased pressure in said one of the pressure spaces in response to decreased pressure in the other of said pressure spaces.

3,918,766

INDIVIDUAL WHEEL ANTI-SKID BRAKE CONTROL SYSTEM HAVING MEANS TO PREVENT EXCESSIVE BRAKE PRESSURE DIFFERENCES

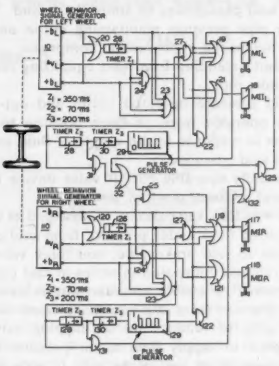
Alfred Klatt, Ronnenberg, Germany, assignor to WABCO Westinghouse G.m.b.H., Hannover, Germany

Filed Feb. 4, 1974, Ser. No. 439,021

Claims priority, application Germany, Apr. 21, 1973, 2320559

Int. Cl.² B60T *8/08*

U.S. Cl. 303—21 P **3 Claims**



1. A fluid pressure actuated anti-skid brake control system for a vehicle having a pair of brake equipped, independently rotatable wheels on opposite ends of an axle, said system comprising:

a. signal generator means for each of said wheels for providing a deceleration signal indicative of a skid condition of the respective wheels;

b. valve means for each of said wheels for effecting independent control of fluid brake pressure at the respective wheels;

c. logic means for each of said wheels responsive to said deceleration signal thereof for providing a first output signal in response to which said valve means of a skidding one of said wheels is operated to terminate the supply of fluid brake pressure thereto and to concurrently release fluid brake pressure therefrom, said logic means of the respective wheels being interconnected such that said first output signal is connected to said valve means of the other one of said wheels for terminating the supply of fluid brake pressure thereto in the absence of a wheel skid thereof, whereby the brake pressure of the non-skidding other one of said wheels remains substantially constant when brake pressure is being released at the skidding one of said wheels, each of said logic means comprising:

i. first AND gate means via which said first output signal is connected to said valve means of the other one of said wheels and;

ii. first timer means responsive to said deceleration signal for establishing a wheel skid correction period during which said first AND gate of said logic means of the other of said wheels is disabled to prevent said logic means of a non-skidding wheel from influencing the brake pressure of a skidding wheel.

3,918,767

ANTISKID VEHICLE BRAKE SYSTEM FOR INDIVIDUAL WHEEL CONTROL INCLUDING A FLUID PRESSURE COMPARATOR DEVICE

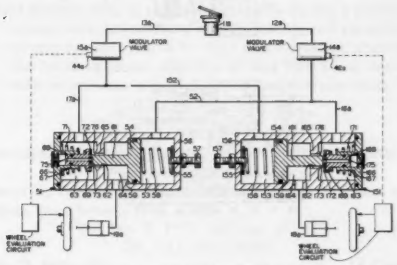
Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse G.m.b.H., Hannover, Germany

Filed Apr. 4, 1974, Ser. No. 457,819

Claims priority, application Germany, June 29, 1973, 2333127

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 A **10 Claims**



1. An antiskid brake control system for a vehicle having a pair of independently rotatable wheels on a common axle of the vehicle, said system comprising:

a. a fluid pressure actuated brake device for each of said wheels;

b. an operator controlled foot valve device via which the brake actuating fluid pressure is selectively controlled;

c. a brake line connecting said foot valve device with each wheel brake device to convey the brake actuating fluid pressure thereto;

d. modulator valve means in each said brake line for modulating the fluid brake pressure at said brake device connected therewith; and

e. evaluation means for each of said wheels operative responsive to a particular dynamic condition thereof for effecting operation of said modulator valve means of a respective wheel, wherein the improvement comprises;

f. means for comparing the fluid brake pressure effective at said brake device of each said wheel so as to influence the higher fluid brake pressure when a predetermined difference arises therebetween.

3,918,768

HYDRAULIC BRAKING SYSTEMS

Glyn Phillip Reginald Farr, Warwick, England, assignor to Girling Limited, Birmingham, England

Filed June 17, 1974, Ser. No. 480,103

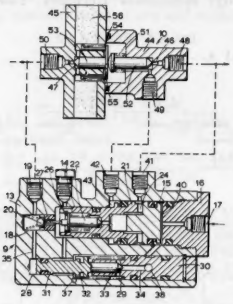
Claims priority, application United Kingdom, June 16, 1973, 28722/73

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 F **12 Claims**

1. A vehicle hydraulic braking system of the kind incorporating a power valve assembly for applying the brakes and means for relieving the braking pressure in the event of a skid condition, wherein said power valve assembly comprises a cylinder, a piston working in said cylinder and responsive to actuation of a brake pedal, a normally-closed first valve comprising a first valve member controlling fluid communication through a first valve seat of which opposite sides respectively communicate with a connection to a first fluid pressure source and with a connection to a brake actuator, a normally-open second valve comprising a second valve member controlling fluid communication through a second valve seat of which opposite sides respectively communicate with a connection to a reservoir and with a connection to said brake actuator, said piston cooperating with said valve members so that upon axial

movement of said piston in response to actuation of said brake pedal said first valve is opened and said second valve is closed, said piston and said cylinder defining between them a pressure space so arranged that on pressurisation of said pressure space said piston is retracted to close said first valve and open second valve to relieve the braking pressure, and wherein said



means for relieving the braking pressure comprises a second fluid pressure source, a fluid connection between said second fluid pressure source and said pressure space of said power valve assembly, and a normally-closed valve means incorporated in said fluid connection and responsive to a skid condition to supply said pressure space with pressure fluid.

3,918,769

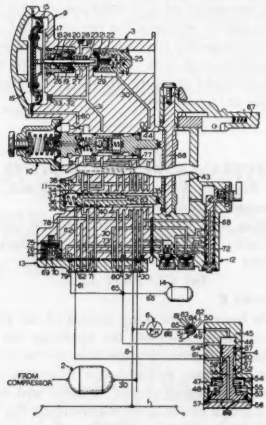
MANUALLY OPERABLE APPARATUS FOR CUT-OFF OF BRAKE PIPE PRESSURE MAINTAINING

Robert J. Worbois, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 21, 1975, Ser. No. 551,629

Int. Cl.² B60T *15/36*

U.S. Cl. 303—66 **4 Claims**



1. A locomotive brake control apparatus for controlling the brakes on the locomotive and the cars in a train comprising the combination of:

a. a normally charged brake pipe, variations of the fluid pressure in which are effective to control brake applications and brake releases on the locomotive and cars,

b. a normally charged main reservoir,

c. a normally charged equalizing reservoir,

d. a brake valve device having:

i. a self-lapping relay valve device which is subject to the opposing pressures in said equalizing reservoir and said brake pipe and is operative by the differential of the pressures in said equalizing reservoir and in said brake pipe to effect the supply of fluid under pressure from said main reservoir to said brake pipe to control and maintain the pressure therein notwithstanding leakage of fluid under pressure therefrom,

ii. control valve means operative to effect the supply of fluid under pressure from said main reservoir to said equalizing reservoir to control the pressure therein, and

iii. a multi-position valve which, in one position, effects the supply of fluid under pressure from said main reservoir to a passageway and, in the other of its positions, opens said passageway to atmosphere, and

e. a brake pipe pressure maintaining cut-in and cut-out means wherein the improvement comprises:

i. a conduit extending from said equalizing reservoir to said brake pipe,

ii. a fluid pressure operated cut-in and cut-out valve device operable from an open position to a closed position in response to the supply of fluid under pressure to said passageway,

iii. a manually operable cut-off valve device having an open and a closed position, and

iv. a one-way flow valve device so arranged as to provide for flow of fluid under pressure from said equalizing reservoir to said brake pipe, said three valve devices being randomly disposed in series in said conduit and cooperative to enable simultaneous release of fluid under pressure from said equalizing reservoir and said brake pipe to render said self-lapping valve device ineffective to supply fluid under pressure from said main reservoir to said brake pipe in response to the release of fluid under pressure from said brake pipe independently of said brake valve device so long as said fluid pressure operated cut-in and cut-out valve device and said manually operable cut-off valve device occupy their open position thereby enabling selective cut in and cut out of maintaining a contact chosen pressure in said brake pipe notwithstanding leakage of fluid under pressure therefrom.

3,918,770

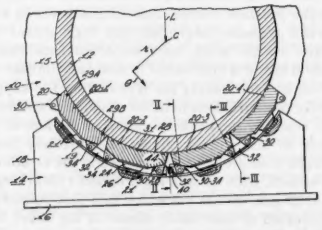
PIVOTED BEARING PAD APPARATUS AND RESTRAINING ARRANGEMENT THEREFOR

Keith E. Rouch, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 12, 1974, Ser. No. 478,736

Int. Cl.² F16C *11/02*

U.S. Cl. 308—2 R **7 Claims**



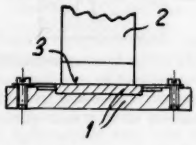
1. A journal bearing of the pivoted pad type comprising a pair of circumferentially spaced pivoted bearing pads positioned contiguous each other on a stationary supporting structure, each bearing pad including a corresponding pivot support means adapting the respective bearing pad for pivotal movement on the stationary supporting structure, each of said

pivot support means having a pivot point about which the corresponding bearing pad pivots, a link member pivotally connected to contiguous ends of the respective pivoted bearing pads of said pair, and means carried by the stationary supporting structure and anchoring said link member and said bearing pads against substantial translational movement in a circumferential direction relative to said supporting structure but permitting pivotal movement of said link member and of said pivoted bearing pads.

3,918,771
PIVOT BEARING

Johann Meier, Brione sopra Minusio, Switzerland, assignor to Precise AG Rechenmaschinenfabrik, Zurich, Switzerland

Filed July 3, 1974, Ser. No. 485,604
Claims priority, application Switzerland, July 7, 1973, 9872/73
Int. Cl.² F16C *11/12*
U.S. Cl. 308—2 A **8 Claims**

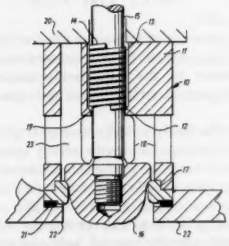


1. A pivot bearing assembly for use in measuring equipment, such as precision weighing scales, said pivot bearing assembly comprising a bearing member having a bearing surface thereon, a supporting member engaged with said surface to permit relative pivotal movement between said bearing and support members about a desired pivot axis, flexible retaining means connected between said bearing member and support member and arranged to resist relative movement between said members other than pivotal movement about said pivot axis, said flexible retaining means extending at least approximately in a plane containing said pivot axis and being connected between said bearing and support members at predetermined locations at least approximately in said plane, a pair of said predetermined locations being disposed respectively at each side of the bearing member in alignment with said pivot axis and at least approximately in said plane containing said axis.

3,918,772
GUIDE ASSEMBLY WITH THIN WALL INSERT

Joseph Van Damme, Sharon, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Sept. 16, 1974, Ser. No. 506,368
Int. Cl.² F16C *29/02*
U.S. Cl. 308—4 R **2 Claims**



1. A guide assembly for guiding a movable shaft, comprising, in combination:

a support member having a passage adapted to receive said movable shaft;

said passage having a cylindrical hole of a predetermined diameter for a portion of its length;

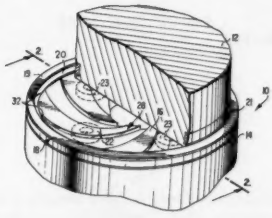
a bearing insert, comprising a thin flat strip of resilient metal wire wound edgewise in a helical coil form, seated in said cylindrical hole of said passage with the outer flat surface of said thin flat strip of resilient metal wire in contact with the portion of the surface of said cylindrical hole having a predetermined diameter and held firmly in contact therewith by radial spring thrust to form a firm cylindrical bearing surface;

said thin flat strip of resilient metal wire having a predetermined thickness whereby when seated against the portion of said cylindrical hole having a predetermined diameter, the resulting inside diameter of said cylindrical bearing surface provides a moving fit for said movable shaft.

3,918,773
MAGNETIC FIELD RESPONSIVE HYDRODYNAMIC BEARING

Robert H. Tuffias, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 7, 1974, Ser. No. 431,436
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **16 Claims**



1. A bearing assembly comprising:

a. at least a first and a second members disposed in proximity to each other, each said member having a bearing surface oppositely disposed to the other, said bearing surfaces forming a chamber therebetween;

b. magnetic fluid present within said chamber;

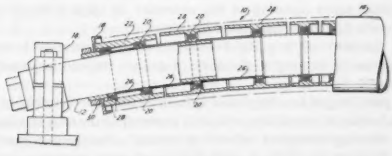
and

c. means for generating a rotating magnetic field within said magnetic fluid, whereby a fluid pressure is created acting against said bearing surfaces of said first and said second members.

3,918,774
BOWED ROLL

Charles B. Nicholson, Glens Falls, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Nov. 7, 1973, Ser. No. 413,531
Int. Cl.² F16C *33/76*
U.S. Cl. 308—187 **2 Claims**



1. In a bowed roll of the type having an elongated curved shaft having opposed ends, a plurality of spools spaced along said shaft and disposed thereabout and a plurality of bearings

spaced along said shaft, each of said bearings having an inner race disposed about said shaft and an outer race supporting one of said spools, the improvement comprising: means for preventing the further longitudinal separation of the bearings closest said opposed ends and a plurality of longitudinally split tubular spacers disposed about said shaft, each of said spacers having an inner diameter disposed about said shaft, an outer diameter, and the length of said spacer measured along said inner diameter being greater than the length measured along said outer diameter, each of said spacers being unattached to said shaft and positioned between a pair of adjacent bearings and having end portions abutting surfaces of the inner races of a pair of adjacent bearings wherein each of said spacer end portions is tapered and the surfaces of the inner races of the adjacent pair of bearings is tapered at a complementary angle to mate with the spacer tapered ends whereby to take up any dimensional differences between said bearing inner race and shaft and locate and hold the bearing concentric to the shaft and to urge each of said spacers against said shaft for frictional engagement therewith.

3,918,775
BEARING HOUSING FOR A CALENDER

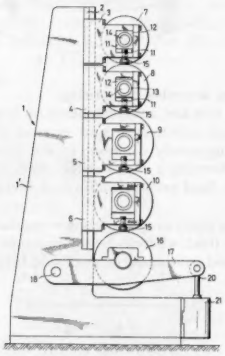
Rolf Lehmann, Mutschellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,301

Claims priority, application Switzerland, Apr. 16, 1973, 5412/73

Int. Cl.² F16C *33/38*

U.S. Cl. 308—193 **8 Claims**



1. A calender comprising

a plurality of rolls for movement in a predetermined direction upon opening of the calender, at least some of said rolls having a roll neck at one end;

a plurality of bearing housings, each respective bearing housing having a plurality of guides therein oriented in said direction;

a plurality of bearing blocks, each respective bearing block having a respective roll neck journalled therein and being slidably mounted in said guides of a respective bearing housing to slide in said direction upon movement of a respective roll in said direction; and

a common guide means mounting said bearing housings thereon.

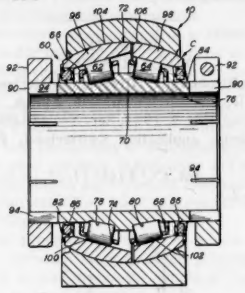
3,918,776
ROLLER BEARING ASSEMBLY

George A. Zimmer; Charles M. Allaben, and William K. Weidman, all of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 267,307, June 29, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 393,084

Int. Cl.² F16C *9/06*

U.S. Cl. 308—194 **4 Claims**



1. A self-aligning roller bearing assembly for use with a housing adapted to be fixed to a support and with a central opening therethrough to receive said assembly, which opening is defined by an arcuate surface, said roller bearing assembly comprising:

a pair of rows of rollers;

an inner race having a cylindrical opening for receiving and supporting a shaft;

the inner race having a pair of raceways, each having surfaces adapted to contact the rollers of a row; and

an outer race;

said outer race being formed of a pair of substantially like members united by means arranged substantially parallel to the major axis of said cylindrical opening and received in an aligned opening in each outer race member;

each member of said outer race having an interior raceway, each said raceway having surfaces adapted to contact the rollers of a row, and an outer arcuate surface adapted to engage the arcuate surface of said housing to permit relative arcuate movement therebetween when said assembly is inserted as a unit therein, said assembly being removable as a unit and being self-aligning to accommodate shaft misalignment with respect to said support when in use in said housing because of the relative movement between said outer race and said housing.

3,918,777
SHEET METAL BALL BEARING RETAINER AND METHOD OF MAKING SAME

Oscar G. Kitchin, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1973, Ser. No. 420,072

Int. Cl.² F16C *33/38*

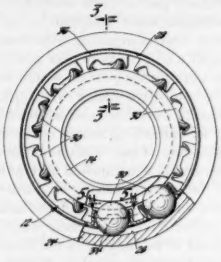
U.S. Cl. 308—201 **9 Claims**

1. A unitary sheet metal retainer for use with a ball bearing having a plurality of balls having centers which lie in a pitch circle determined by the balls being disposed in the ball grooves of relatively rotatable inner and outer races comprising:

a flat ring sufficiently radially spaced from said pitch circle for guiding engagement with axially spaced lands on one of said races located on the same side of said pitch circle as said flat ring, said flat ring having a plurality of circumferentially spaced holes therethrough,

a plurality of cylindrical sleeves aligned with said plurality of circumferentially spaced holes in said flat ring and depending radially from the marginal portions of said flat ring adjacent said holes for receiving said balls with a running clearance,

each of said cylindrical sleeves having a pair of diametrically opposed radially depending tongues having roots at a location between said flat ring and said pitch circle and terminal edges located on the opposite side of said pitch circle from said roots and circumferentially spaced apart less than the diameter of said balls to prevent said balls from dropping out of said sleeves past the terminal edges of said pairs of tongues in the absence of the other of said races, and



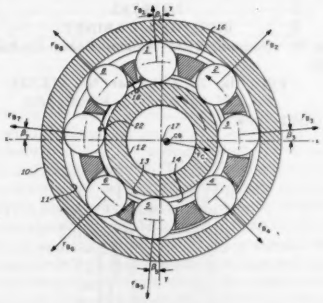
said pairs of tongues being sufficiently laterally resilient to allow the forced passage of said balls between the terminal portions of said pairs of tongues and into said sleeves without any appreciable permanent deformation to said tongues whereby said retainer is capable of forming a unit-handled subassembly with said balls and said one race.

3,918,778

DYNAMICALLY BALANCED BEARING ASSEMBLY

Peter E. Jacobson, Phoenix, and Robert L. Pirman, Scottsdale, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,635
Int. Cl. F16c *33/38*
U.S. Cl. 308—201 **12 Claims**



1. An anti-friction bearing assembly for supporting a rotatable member for rotating about an axis in a support member, the combination comprising,

an outer bearing ring having outer bearing race and land portions,

an inner bearing ring having inner bearing race and land portions,

a plurality of rotatable elements therebetween and in normal rolling contact with said races, and

a generally cylindrical bearing cage between said rings having a corresponding plurality of generally radially extending pockets for controlling the relative angular positions of said rotatable members, said rotatable elements normally producing in operation a corresponding plurality of radial inertial forces on said outer bearing ring, said forces normally tending to vary in a random manner in accordance with random variations in the element positions within said cage pockets,

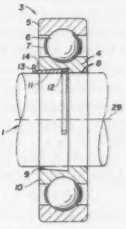
said bearing cage having a mass center of gravity that is eccentric to said rotation axis for producing, in operation, a centrifugal force radially displacing said cage between said bearing rings such that a point surface thereof contacts a land portion of one of said bearing races and thereby maintains said cage in predetermined substantially constant position relative to said one race whereby to maintain its radial inertial force vector substantially constant and predictable.

3,918,779

SYSTEM FOR SECURING ROLLER BEARINGS

Leonhard Halliger, and Horst Schroder, both of Schweinfurt, Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed May 14, 1973, Ser. No. 360,399
Claims priority, application Germany, May 19, 1972, 2224437
Int. Cl.² F16B *2/14*
U.S. Cl. 308—236 **10 Claims**



1. A bearing adapted to be secured on a cylindrical member such as a shaft or in the bore of a sleeve bushing, comprising an inner race member, an outer race member and a plurality of roller means located therebetween, one of the surfaces of one of said race members having a cylindrical portion adapted to abuttingly engage the respective cylindrical member and an annular axially tapered slot formed therein radially narrowing outwardly from said abutting portion toward the outer axial end, and retaining means comprising an arcuate section member having a width less than the axial length of said slot, an internal diameter conforming to that abutting portion and at least one axially extending wedge shaped tongue secured thereto, said axially extending wedge tongue conforming in its cross-section to the taper of said slot and being compressively positioned in said slot, and having a width substantially less than that of said arcuate section member.

3,918,780

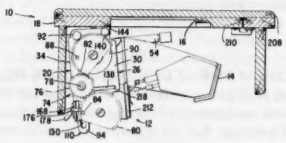
SEWING MACHINE CABINET

Russell A. Fritts, Warren, N.J., assignor to The Singer Company, New York, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,799
Int. Cl.² A47B *29/00*
U.S. Cl. 312—30 **5 Claims**

1. In a sewing machine cabinet for accommodating a sewing machine in a plurality of positions relative to said cabinet and including an interior portion, a table surface having an opening therein for accommodating a sewing machine, cover means for covering the opening when the sewing machine is disposed in a first position for storage beneath said table surface, a pivotable leaf member for cooperating with the sewing machine and the table surface when the sewing machine is in a second position for flat bed sewing, a pivotably mounted frame means for supporting the sewing machine in said first and second positions and a third position wherein the

sewing machine is disposed for cylinder bed sewing, and a positioning mechanism for holding said frame means and the sewing machine in said first, second and third positions, said positioning mechanism including a preloaded torsion means for assisting elevation of said frame means from said first position toward said second position, latch means for releasably locking said frame means in said second position, elevator means on said frame means for supporting and moving the sewing machine between said second and third positions, gear



means disposed on said frame means in cooperating relationship with said elevator means for driving said elevator means relative to said frame means between said second and third positions, control means engageable with said gear means for initiating movement of said gear means to drive said elevator means, said preloaded torsion means further including means for assisting said elevator means in moving from said second position to said third position, and locking means for releasably locking said elevator means in said third position.

3,918,781

JUXTAPOSABLE AND SUPERPOSABLE FURNITURE PIECES

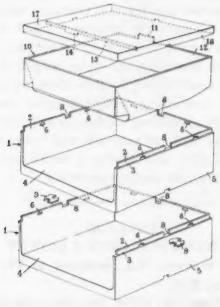
Boris Paris, Clichy, France, assignor to Societe Industrielle et Commerciale de Transformation des Plastiques "Slcopal", Douai, France

Filed Mar. 21, 1974, Ser. No. 453,357

Claims priority, application France, Mar. 29, 1973, 73.11321

Int. Cl.[2] A47B *87/02, 88/06, 88/16;* **F16B** *12/12*

U.S. Cl. 312—111 **5 Claims**



1. A set of furniture pieces to be assembled comprising substantially box-shaped units adapted to be juxtaposed and superposed, each unit comprising a bottom, a pair of sidewalls, a backwall and a front access aperture, each of said walls having an upper edge portion which is thinner than the remainder of the respective wall, a rim projecting downwardly from said bottom of each unit and adapted to fit around an edge portion of an underlying unit, a notch in said upper edge portion of at least one of said walls adapted to register with a similar notch formed in a juxtaposed unit, at least one substantially H-shaped flat key comprising a central web and a pair of flanges projecting substantially normal to said web from opposite ends and respectively to opposite sides of said web, said web being adapted to be located in the notches of said upper edge portions of a pair of juxtaposed units with the flanges thereon engaging the inner surfaces of abutting walls of said units, and an additional notch in said rim in vertical alignment with each notch in said upper edge portion, said web being adapted to be also located in the additional notches of a pair of units superimposed upon said pair of the juxtaposed units.

3. A set of furniture pieces to be assembled comprising substantially box-shaped units adapted to be juxtaposed and superposed, each unit comprising a bottom, a pair of sidewalls, a back wall and a front access aperture, each of said walls having an upper edge portion which is thinner than the remainder of the respective wall, a rim projecting downwardly from said bottom of each unit and adapted to fit around the edge portion of an underlying unit, a notch in said upper edge portion of at least one of said walls adapted to register with a similar notch formed in a juxtaposed unit, at least one substantially H-shaped flat key comprising a central web and a pair of flanges projecting substantially normal to said web from opposite ends and respectively to opposite sides of said web, said web being adapted to be located in the notches of said upper edge portions of a pair of juxtaposed units with the flanges thereon engaging the inner surfaces of abutting walls of said units, a plurality of drawers each adapted to fit easily into one of said units to be guided by said side walls, said drawers having upper edges which are located below said keys when said drawers are inserted in said units, the rear wall of each drawer comprising an integral lug projecting upwardly from the upper edge of the rear wall of the drawer and being offset in relation to the axis of the drawer, four crossed stiffening ribs carried by the lower face of the bottom of each unit and each provided with a downwardly projecting stop lug, said stop lug being offset in relation to the axis of the drawer in an underlying unit so that one of said stop lugs is adapted to engage the lug projecting upwardly from the upper edge of the rear wall of the drawer in an underlying unit when said drawer is partly withdrawn from the respective unit, regardless whether the access openings of the superimposed units face in the same or in different directions.

3,918,782

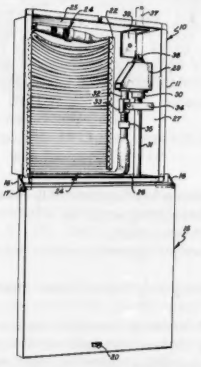
FIRE HOSE CABINET

Thomas R. Allmand, 1735 Holmes Road, Ypsilanti, Mich. 48197

Filed May 23, 1974, Ser. No. 472,726

Int. Cl.[2] A47B *67/02;* **B05B** *15/06*

U.S. Cl. 312—204 **2 Claims**



1. A household fire fighting unit comprising a rectangular cabinet body adapted to be mounted within a wall opening with its forward open side substantially flush with the exterior of a wall, a length of fire hose normally housed in folded

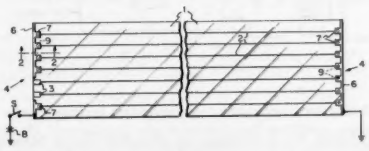
relation in the cabinet body, a pair of upstanding spaced parallel rails within the cabinet body defining a guidance and support means for the hose whereby the hose may be pulled from the cabinet body for use without restriction and stored in the cabinet body in a stabilized condition, said rails extending substantially from top to bottom of the cabinet body with one rail of the pair adjacent one side wall of the cabinet body and the other rail spaced inwardly of the opposite side wall of the cabinet body, a water chamber element within the portion of the cabinet body between the last-named rail and said opposite side wall, a standpipe section received through the bottom of the cabinet body and coupled with and communicating with said chamber element, a parallel depending outlet pipe connected with and communicating with the chamber element within said portion of the cabinet body in closely spaced relation to said standpipe section and being coupled with one end of said fire hose, a petcock connected in said parallel depending outlet pipe and having an operating handle projecting across the standpipe section and said outlet pipe when the petcock is closed, a cover for said cabinet body hinged to the lower end thereof and adapted when open to swing downwardly entirely below the cabinet body to provide full access to the interior thereof, and means simulating a wall mounted framed artistic picture on the side of the hinged cover which is forwardmost when the cover is in the upward closed position.

3,918,783

APPARATUS FOR ELECTRICALLY CONNECTING CONDUCTORS ON GLASS SUBSTRATES

Gideon A. DuRocher, and Daniel J. DuRocher, both of Mt. Clemens, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Apr. 17, 1974, Ser. No. 461,537
Int. Cl.² B60L *1/02*
U.S. Cl. 339—17 LC **15 Claims**



1. In combination: a non-conductive substrate; a plurality of spaced apart conductors carried by said substrate at one side length a conductive member of such lengths as to span said conductors and having resilient portions; means mounting said conductive member on said substrate with said resilient portions overlying said conductors; and a plurality of compressible pads corresponding in number and spacing to the number and spacing of said conductors and being interposed between and in engagement with said resilient portions and said conductors, each of said pads being electrically conductive when compressed, and the resilience of said resilient portions maintaining said pads in compressed, electrically conductive condition.

3,918,784

MINIATURE CONNECTOR FOR CIRCUIT COMPONENT

Timothy Allen Lemke, Dillsburg, and Jay Forrest Vogel, Boiling Springs, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 5, 1974, Ser. No. 476,494
Int. Cl.² H01R *13/10*
U.S. Cl. 339—17 C **9 Claims**

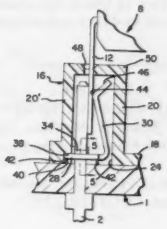
2. A connector, comprising:

a dielectric housing having an internal cavity,

means having a resilient beam in said cavity and a base portion latched to said housing,

said base portion having an aperture and a pair of opposed locking lances adjacent said aperture for locking onto a male terminal,

said housing having a first opening adjacent said base for receiving a first male terminal in locked receipt with said lances, and



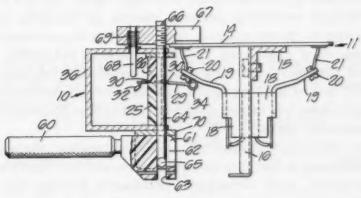
said housing having a second opening adjacent said beam, the second opening of said housing being located on an axis extending between said first male terminal and said beam to permit receipt of another male terminal in said second opening in gripped relationship between said first male terminal and said beam.

3,918,785

GANG CONNECTOR CLAMPABLE TO A COMMUNICATION CABLE TERMINAL BOARD

Albert Bernstein, Santa Monica, Calif., assignor to Peritech International Corporation, Los Angeles, Calif.

Filed Nov. 14, 1973, Ser. No. 415,777
Int. Cl.² H01R *13/50*
U.S. Cl. 339—18 R **26 Claims**



1. A gang connector quickly attachable to and detachable from an elongated terminal board of the type having a multiplicity of pairs of conductor terminal strips in closely spaced apart array along at least one lateral side thereof,

said gang connector having a rigid main body substantially as long as said terminal board and rigidly supporting separate resilient contactors having one end thereof positioned to make simultaneous contact with a respective one of said terminal strips along at least said one lateral side of said terminal board,

said main body at spaced apart areas theralong having manually operable clamping jaw means engageable with the juxtaposed exposed outer edge portion of the terminal board and operable as said jaw means are tightened after said connector is in its proper operating position to place said resilient contactors under stress and cooperating with said stressed resilient contactors to hold said gang connector rigidly assembled to one lateral half of said terminal board with the terminal strips along one side thereof in firm electrical contact with a separate one of said resilient contactors,

with said resilient contactors each comprising a similar flexible strip having portions thereof projecting from the

opposite lateral sides of said main body, and first and second disconnectable cable connector means mounted on said gang connector, each of said cable connector means having a separate terminal thereof connected to a respective one of said contactors but in reverse sequence, and

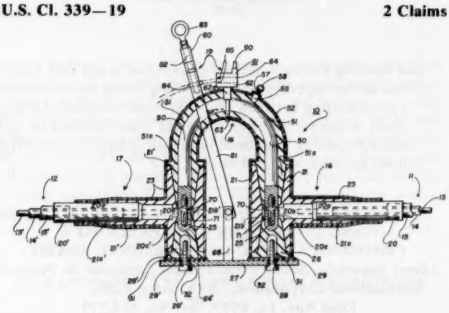
means automatically responsive to end-for-end inversion of said gang connector to block the attachment of a cable connector to one of said first and second cable connector means.

3,918,786

ELECTRICAL CONNECTOR APPARATUS

Don P. Chaney, and James E. McClain, both of Greenville, Tex., assignors to Esco Manufacturing Company, Greenville, Tex.

Filed June 17, 1974, Ser. No. 480,039
Int. Cl.² H01R *13/62*
U.S. Cl. 339—19 **2 Claims**



1. Electrical cable connecting apparatus, comprising:

a. common mounting support means,

b. first and second insulator housings rigidly affixed to said common mounting support means at laterally spaced locations thereon, said insulator housings comprising respective elongated insulating jackets extending from said common mounting support means in directions parallel to one another, each of said insulator housings having conductive means disposed within the confines of said insulating jacket,

c. an elongated conductor axially extending through an insulating jacket in a direction transverse to said parallel direction, said elongated conductor having one end adapted for coaxial termination with a high voltage electrical cable and and the other end electrically connected with one of said conductive means,

d. generally U-shaped connector link means including a central conductor axially extending through, and entirely surrounded by, an insulating jacket, the end portions of the central conductor being adapted for respective removable mateable engagement with said conductive means disposed within said insulator housings, the end portions of said insulating jacket of said link means being adapted for respective removable mateable engagement with the elongated insulating jackets of said insulator housings, said link means being simultaneously disconnectably coupled with said first and second insulator housings to electrically connect said conductive bodies by way of the central conductor of said connector link means, and

e. jack assembly means for facilitating the respective retraction and advancement of said U-shaped connector link from and into coupling engagement with said insulator housings, said jack assembly comprising:

a catch assembly comprising a housing having a channel therein, said channel extending to at least one side of said housing to define an opening thereto, said housing being so mounted to said U-shaped connector link means to position said channel above, and tangential to, the apex of said U-shaped connector link means, and

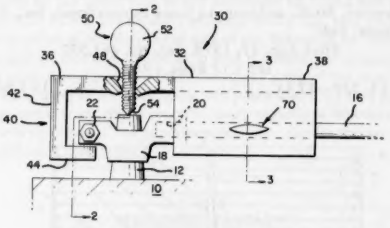
an arm assembly comprising a generally U-shaped frame having parallel disposed arms, a shaft threadably connected at the apex of said frame and extending intermediate, and generally parallel to, said arms, washer means affixed at one end of said shaft and dimensioned to fit within the confines of said channel, said arm assembly being mounted so that said parallel disposed arms straddle the U-shaped connector link means and are pivotally movable about a point disposed directly below the apex of said U-shaped connector link means, whereby the pivoting of said arm assembly to a substantially vertical position disposes said washer means within said channel to enable the respective retraction and advancement of said link means from and into coupling engagement with said insulator housings in response to the rotation, in one direction and the other, of said threadably connected shaft.

3,918,787

BATTERY TERMINAL DEVICE

Kenneth Scott Hays, Exton, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 25, 1974, Ser. No. 482,701
Int. Cl.² H01R *31/08*
U.S. Cl. 339—19 **5 Claims**



1. A device for completing an electrical circuit between a battery post and a wire coupled to the post by a battery terminal while bypassing the battery terminal, comprising an elongated member having a first portion overlying the post and a second portion overlying the wire, means in said first portion for directly contacting said post, means in said second portion for directly contacting the conductor of the wire, said post contacting means and said wire contacting means being electrically connected by said elongated member so as to complete an electrical circuit therebetween.

3,918,788

BUS CLIP AND BUS STRIP

Leo Walter, Palos Verdes Peninsula, and Helmut W. Greul, Malibu, both of Calif., assignors to Electronics Stamping Corporation, Gardena, Calif.

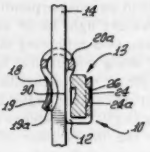
Filed Sept. 6, 1974, Ser. No. 503,674
Int. Cl.² H01R *31/08*
U.S. Cl. 339—19 **11 Claims**

1. In a clip operable to connect an electrical terminal post with a bus strip,

a. a channel section having upwardly extending, laterally spaced and opposed arms between which the bus strip is receivable,

b. and a generally hook shaped section integral with one of said arms, said hook shaped section including a tang extending downwardly at the lateral side of said one arm opposite the other arm of the channel shaped section, the

tang also laterally aligned with said other arm, said hook shaped section containing an opening to pass said terminal post in vertically oriented relation between said tang and said one arm.



3,918,789

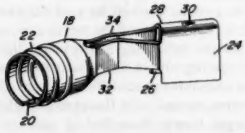
BENDABLE PLUG WIRE-TO-SPARK PLUG CONNECTOR

Neal R. Davis, 916 NW. 14, Oklahoma City, Okla. 73106

Filed Nov. 30, 1973, Ser. No. 420,688

Int. Cl.² H01R *13/12*

U.S. Cl. 339—245 **5 Claims**



1. An electrical connector of unitary construction for conductively connecting two terminal end portions, comprising:

a. a first terminal contacting portion at one end of said connector, said first terminal contacting portion comprising a split tubular ferrule including at least one circumferential rib extending outwardly therefrom;

b. a second terminal contacting portion at the other end of said connector comprising a generally U-shaped ferrule and means integral with said U-shape to make electrical contact with an electrical cable, whereby the walls of said U-shaped ferrule are adapted to be crimped onto said cable, said second terminal contacting portion normally aligned with said first terminal contacting portion and adapted to be angularly displaced therefrom; and

c. a transistion section connecting said first and second terminal contacting portions, said transition section comprising a pair of elongated, mutually independent, spaced apart, generally parallel, bendable strap portions including at least one preformed transverse bend in each strap portion, said strap portions including first and second pairs of corresponding opposite end portions, said first pair of corresponding end portion secured to and extending from diametrically opposite portions of said first terminal contacting portion and said second pair of corresponding end portions secured to said walls of said U-shaped second terminal contacting portion, said strap portions being free of connection with each other intermediate said pairs of corresponding opposite end portions and including segments which converge toward and diverge away from, and which substantially parallel, each other between said ferrules.

3,918,790

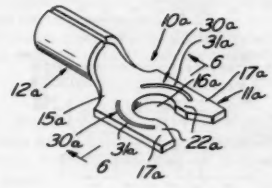
SNAP SPADE ELECTRICAL CONNECTOR

John Richard Filson, Medford, N.J., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 14, 1974, Ser. No. 479,313

Int. Cl.² H01R *11/22*

U.S. Cl. 339—257 **7 Claims**



1. A snap spade electrical connector comprising a generally flat U-shaped lug engaging part including a bight portion having a lug receiving open region, a pair of legs extending longitudinally of each other from opposite ends of said bight portion on opposite sides of said open region and defining therebetween a longitudinally inwardly extending passageway opening into said open region, a pair of opposed inner projections on respective legs extending into said passageway toward and terminating short of each other to define a passageway constriction, said legs and inner projections being generally flat and coplanar with said bight portion, and work-hardened regions extending longitudinally along each leg for enhanced resistance of the leg to repeated snap engagement of a lug through said constriction, said work-hardened regions each comprising an elongate compressed location defining a surface groove on at least one side without increased leg thickness.

3,918,791

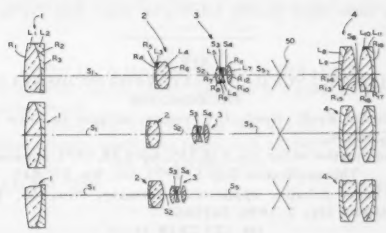
FLAT FIELD VARIABLE POWER RIFLE SCOPE

Donald M. Perry, Gresham, Oreg., assignor to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Oct. 18, 1974, Ser. No. 516,004

Int. Cl.² C02B *7/10*

U.S. Cl. 350—42 **10 Claims**



1. In a flat field variable power rifle scope, proceeding from front to rear,

a fixed objective,

a focus compensating field lens member movable non-linearly,

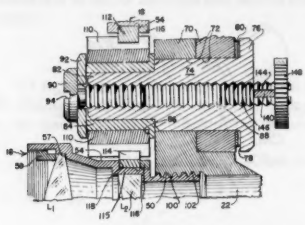
a power varying anastigmat erector lens group having lenses fixed relative to each other and movable as a unit,

the erector lens group being highly corrected to provide a flat field to the system over a wide range of magnification, and an eyepiece.

3,918,792
BINOCULAR WITH FOCUSING MECHANISM

William J. Beecher, 1960 Lincoln Park West, Chicago, Ill. 60614

Division of Ser. No. 312,022, Dec. 4, 1972. This application May 13, 1974, Ser. No. 469,400
Int. Cl.[2] G02B 7/06
U.S. Cl. 350—76 2 Claims



1. A binocular comprising a pair of telescopes, a hinge pin hingedly connecting said telescopes together for swinging movement toward and away from each other for inter-pupillary adjustment, each telescope including a shell presenting a forward upper objective aperture and a rear lower eyepiece aperture, the planes of said apertures extending in parallelism, a lens-containing eyepiece fixedly mounted in said eyepiece aperture, said objective aperture being provided with an internally threaded rim, a tubular lens-containing objective barrel having a rear threaded section threadedly received in said rim for focusing adjustment upon rotation of the barrel in either direction, an optical erecting system disposed within said shell and effective between said eyepiece and objective barrel, said barrel having a second threaded section forwardly of the rear threaded section, and an adjacent reduced cylindrical section terminating in an annular radial shoulder, a gear ring encompassing said cylindrical section and normally being freely rotatable and axially slidable thereon, a pinion rotatably mounted on said hinge pin and meshing with the gear rings of each telescope whereby rotation of either gear ring will induce rotation of the other gear ring, and a friction nut threadedly received on said second threaded section and effective when partially tightened against the adjacent gear ring to clamp said latter gear ring against the shoulder with varying degrees of friction whereby individual focusing of the lens-containing barrels may be attained by restraining rotation of either objective barrel while forcibly rotating the other objective barrel.

3,918,793
FLUORESCENCE ILLUMINATOR FOR INCIDENT LIGHT MICROSCOPE

Winfried Kraft, Werdorf, Germany, assignor to Ernst Leitz G.m.b.H.

Continuation of Ser. No. 138,235, April 28, 1971, abandoned. This application July 6, 1973, Ser. No. 377,042
Claims priority, application Germany, Nov. 13, 1970, 2055944; May 2, 1970, 2021654
Int. Cl.[2] G02B 21/16
U.S. Cl. 350—91 13 Claims

1. A fluorescence illuminator for incident light for a microscope system including:

a light source generating an exciter light beam having an axis;

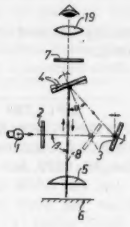
an objective lens;

a fluorescing object generating a fluorescent light beam having an axis;

viewing means located along an imaging beam axis positioned between said viewing means and said objective lens, said imaging beam axis and said fluorescent light beam axis being coincident;

a reflecting mirror positioned along said exciter light beam axis and deflecting said exciter light beam to said fluorescent light beam axis and generating a deflected exciter light beam axis subtending an angle α of about 70°–15° with said fluorescent light beam axis, said reflecting mirror tiltable about an axis perpendicular to a plane formed by said fluorescent light beam axis and by said exciter light beam axis, said reflecting mirror having means for displacement along said exciter light beam axis;

a dichromatic splitter mirror producing a steeply reflecting border as light strikes it at angles approaching the normal and at smaller angles of incidence located on said imaging beam axis at the intersection of said fluorescent light beam axis and said deflected exciter light beam axis be-



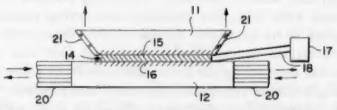
tween said objective lens and said viewing means, said dichromatic splitter mirror tiltable about an axis perpendicular to a plane formed by said fluorescent light beam axis and by said exciter light beam axis, said dichromatic splitter mirror reflecting said exciter light beam toward said fluorescing object along said fluorescent light beam axis and transmitting said fluorescent light beam toward said viewing means, said fluorescent light beam having a wave length longer than that of said exciter light beam, said angle α providing an optimum separation of said exciter light beam and said fluorescent light beam; and

a blocking filter positioned at a position on said imaging beam axis between said dichromatic splitter mirror and said viewing means.

3,918,794
LIQUID CRYSTAL OPTICAL SWITCH COUPLER

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,588
Int. Cl.[2] G02B 5/14; G02F 1/13
U.S. Cl. 350—96 C 7 Claims



1. An optical coupler for switching a portion of optical radiation traversing a multimode fiber bundle transmission line to at least one other optical transmission line which comprises:

a first elongated solid optical transmission rod connected into a multimode fiber bundle transmission line;

said rod having the same cross sectional area as said transmission line at the connection;

at least one elongated solid optical transmission rod assembled adjacent said first rod with its length along side said first rod and connected to a multimode fiber transmission line;

said first rod and said rods assembled adjacent thereto having flat surfaces along their adjacent alignment, and have the same optical index of refraction;

a liquid crystal between said first rod, and said rods assembled along side thereof along the adjacent flat surfaces thereon;

said liquid crystal having a normal index of refraction less than that of said rods;

a pair of optically transparent electrodes on opposite sides of said liquid crystal along said flat surfaces on said rods; whereby an electrical voltage changes the index of refraction of said liquid crystal to that of said rods thereby permitting radiation coupling between said rods.

3,918,795

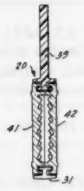
RETRO-REFLECTOR CONSTRUCTION

Henry Lindner, Woodale, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Co., -Elgin Molded Plastics Div., Elgin, Ill.

Continuation-in-part of Ser. No. 351,308, April 16, 1973, abandoned. This application Feb. 4, 1974, Ser. No. 439,043

Int. Cl.² G02B *5/124*

U.S. Cl. 350—103 **16 Claims**



1. In a one-piece reflector body of molded, transparent plastic, said body being generally flattened and having a generally smooth front face and a back face in spaced relationship thereto with a plurality of lenticular facets integrally formed therein which are adapted for retro-reflection of incident light striking the front face thereof at predetermined angles, the improvement which comprises a pair of spaced, parallel flanges, each such flange (a) being integrally formed with said body, (b) upstanding normally from said back face, and (c) extending continuously about the periphery of said back face, one such flange being inwardly spaced relative to the other thereof, said flanges defining a channel therebetween.

3,918,796

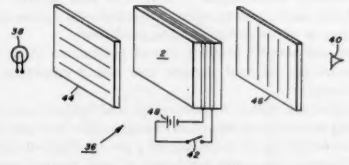
LIQUID-CRYSTAL NON-LINEAR LIGHT MODULATORS USING ELECTRIC AND MAGNETIC FIELDS

James L. Fergason, Kent, Ohio, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 113,948, Feb. 9, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,565

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **42 Claims**



1. An optical device for continuous control of light transmission comprising:

electro-optical cell means including liquid crystal means having positive dielectric anisotropy disposed between two spaced plates, at least one of which plates is transparent and each plate being electrically conductive at a surface facing said liquid crystal means;

said plates being wall-oriented to cause said liquid crystal means to define a twisted structure in the direction perpendicular to the plates;

polarizing means disposed one before and one behind the liquid crystal means, in the direction of light traveling through the cell means; and

electrical means connected to the plates for controlling the twisted structure of said liquid crystal means.

3,918,797

ZOOM LENS HAVING A SHIFTABLE DIAPHRAGM DISPOSED BETWEEN TWO ZOOM COMPONENTS

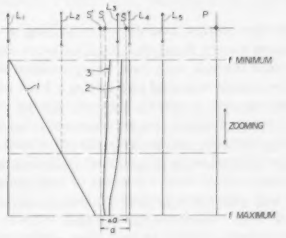
Eiichi Takano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Feb. 20, 1974, Ser. No. 444,178

Claims priority, application Japan, Feb. 24, 1973, 48-21766

Int. Cl.² G02B *15/16*

U.S. Cl. 350—186 **3 Claims**



1. An optical objective of the zoom type comprising, in combination, a focussing lens group; a lens group movable, for zooming, along the optical axis; a relay lens group; and a variable aperture diaphragm arranged within said movable lens group for shifting relative to a component of said movable lens group with adjustment of its aperture during such relative shifting to compensate the variation of the aperture ratio caused by shifting of said diaphragm; said component of said movable lens group, during such relative shifting, correcting the image of said diaphragm to maintain said image substantially constant in position relative to said relay lens group.

3,918,798

ZOOM LENS HAVING TWO DIAPHRAGMS

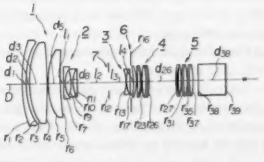
Eiichi Takano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Feb. 11, 1974, Ser. No. 441,657

Claims priority, application Japan, Feb. 13, 1973, 48-17701

Int. Cl.² G02B *15/16*

U.S. Cl. 350—186 **3 Claims**



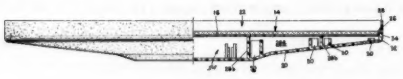
1. A zoom lens comprising, in combination, a focusing lens; a variator lens moving, during a zooming operation, in the

direction of the optical axis of said zoom lens; a compensator lens moving, during a zooming operation, in the direction of said optical axis; a relay lens; a first diaphragm device positioned between said compensator lens and said relay lens to determine the F-number; and a second diaphragm device positioned between said variator lens and said first diaphragm device, said second diaphragm device being movable along said optical axis in the same direction as movement of said variator lens and with a predetermined relationship with the movement of said variator lens.

3,918,799
MIRROR CASE

Arthur W. Kurz, Jr., Birmingham, and Harold R. Wilson, Holland, both of Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed May 1, 1973, Ser. No. 356,074
Int. Cl. G02b *5/08*
U.S. Cl. 350—288 **21 Claims**



1. A rearview mirror assembly comprising a case and a mirror element having front and back surfaces and a peripheral edge fitted therein; said case being molded in one piece from a thermoplastic material and having a back and a continuous peripheral side outlining said peripheral edge of said mirror element and being spaced outwardly therefrom; said case including support means for supporting said mirror element; said peripheral sides of said case including arcuate wall means curving over at least a portion of said peripheral edge and contacting said front surface of said mirror element for holding said mirror element against said support means, retaining said mirror element in said case, and preventing forward and rearward movement of said mirror element out of its general plane within said case; said assembly including a space between the entire thickness of said peripheral edge of said mirror element and said outwardly spaced peripheral sides of said case; said arcuate wall means including means for allowing differential expansion between said mirror element and said case generally in the plane of said element into said space while said arcuate wall means remain in contact with said front of said element; said space adapted to be substantially filled by said peripheral edge of said mirror in different temperatures and providing an expansion and contraction area for said assembly to prevent breakage of said element when said assembly is exposed to extreme temperature conditions.

3,918,800
IMPACTING JET AERODYNAMIC WINDOW

William Stanley Griffin, Manhattan Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 28, 1974, Ser. No. 446,811
Int. Cl.² H01S *3/22*
U.S. Cl. 350—319 **10 Claims**

1. An impacting jet aerodynamic window for use in providing an unobstructed light path between the interior of a chamber containing a first gas and an area outside of said chamber containing a second gas,

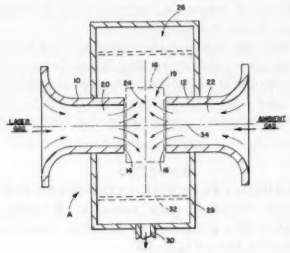
a first nozzle having its inlet connected in fluid communication with said chamber,

means for introducing said first gas into the inlet of said first nozzle at a velocity sufficient to cause a jet of said first gas to be emitted at the outlet of said first nozzle,

a second nozzle having its inlet connected in fluid communication with said area outside of said chamber,

means for introducing said second gas into the inlet of said second nozzle at a velocity sufficient to cause a jet of said second gas to be emitted from the outlet of said second nozzle,

the outlets of said nozzles being positioned in axial alignment with each other in opposing relationship for permitting the jets

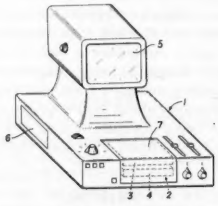


to impact against each other form a stable flat laminar impact plane.

3,918,801
PLAYBACK DEVICES

Friedrich Bauhofer, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria, a part interest to each

Filed Oct. 2, 1973, Ser. No. 402,825
Claims priority, application Australia, Oct. 3, 1972, 8461/72
Int. Cl.² G03B *23/02*
U.S. Cl. 352—72 **15 Claims**



1. In a motion-picture projector having reading means for concurrently reproducing the contents of a picture strip and a sound strip respectively stored in a pair of associated cassettes, in combination:

a manually loadable cassette holder receivable in the body of the projector for accommodating a picture cassette and a sound cassette in operative juxtaposition with said reading means upon insertion of said holder into said body, said cassettes being provided with distinctive markings in predetermined code positions;

first and second sensing means positioned to detect said markings of said picture and sound cassettes, respectively;

comparison means responsive to said first and second sensing means upon insertion of said holder into said body for ascertaining the presence of a predetermined correlation between the code markings of said picture and sound cassettes; and

signaling means connected to said comparison means for indicating the absence of said correlation.

3,918,802
MOTION PICTURE CAMERA WHICH CAN USE DIFFERENT KINDS OF FILM CARTRIDGES CONTAINING DIFFERENT LENGTH OF FILM

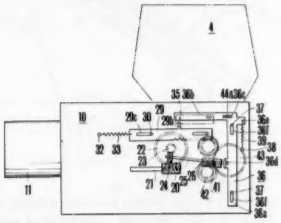
Keiichi Sakaguchi, Yokohama; Yoshio Komine, Tokyo; Toshikazu Ichiyanagi, Tokyo; Mamoru Shimazaki, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1974, Ser. No. 462,541

Claims priority, application Japan, Apr. 23, 1973, 48-46386; Apr. 23, 1973, 48-46394

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 **30 Claims**



1. A camera, adapted for use with different types of film cartridges containing films of different lengths, in separate occasions as desired, comprising:

a housing containing a cartridge housing chamber into which any one of said different types of cartridges can be loaded;

an indicating means for indicating the length of the film contained in the cartridge loaded in said housing chamber, wherein said indicating means includes indicating portions which can be selected in accordance with a corresponding one of said cartridges so that the proper length of the film contained in any particular cartridge of said different cartridges can be indicated; and

means for selecting the indication state of said indicating means according to the kind of the cartridge loaded into said housing chamber, wherein said selecting means is operatively connected to said indicating means and modifies said indicating means so that the indication portion of said indicating means indicates the proper length of film contained in the cartridge loaded into said housing chamber.

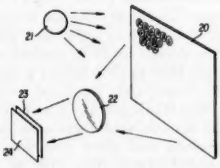
3,918,803
DISPLAY OF MULTICOLOR IMAGES USING A SCREEN WITH RED, BLUE AND GREEN PHOTOLUMINESCENT SEGMENTS

Albert A. Friesem, Rehovot, Israel, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Division of Ser. No. 239,594, March 30, 1972, Pat. No. 3,823,412. This application May 30, 1974, Ser. No. 474,783

Int. Cl.² G03B *21/00*

U.S. Cl. 353—121 **2 Claims**



1. An apparatus for displaying a multicolor image wherein the colors of the image are formed by a plurality of basic colors or a combination thereof comprising means defining a display area for the image including a plurality of light excitable light emitting elements within said area for each of said basic colors, all of said elements being excitable by light to emit the respective color in accordance with the intensity of the exciting light, said elements for each color being spaced from adjacent elements of the same color to define a desired resolution for the color within the image, said elements forming a regular array of alternating red, blue and green elements, and means for projecting light onto said display area including record means having coded information thereon projectable as a plurality of image segments of respective light intensities in accordance with said coded information with each segment corresponding to a said element to be excited, said record means comprising a black and white transparent medium and said coded information thereon comprising a regular array of alternating first, second and third sections which are geometrically similar to said regular array of alternating red, blue and green elements, with all of said first sections, said second sections and said third sections containing information in terms of transparency about only red, only blue and only green respectively present in portions of a multicolor subject, and means for illuminating said record means to cast said plurality of image segments onto said display area so that each image segment excites a particular light emitting element to emit its respective color and thereby form said multicolor image.

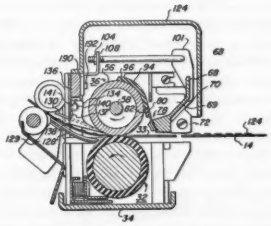
3,918,804
APPARATUS FOR APPLYING RELEASE MATERIAL TO A CONTACT FUSER ROLL MEMBER UTILIZED IN FIXING TONER IMAGES TO SUPPORT SHEETS

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 24, 1974, Ser. No. 482,727

Int. Cl.² G03G *21/00*

U.S. Cl. 355—3 R **6 Claims**



1. Fuser apparatus for fixing toner images to support sheets said apparatus comprising:

a heated roll structure;

a resilient backup roll structure cooperating with said fuser roll structure to form a nip through which said support sheets move;

a sump for containing release material;

release material disposed in said sump and contacting said heated fuser roll structure, said release material being solid at room temperature and liquid at the operating temperature of said fuser apparatus; and

means supported by said sump for maintaining said release material in contact with said fuser roll structure when said release material turns from a liquid to a solid.

3,918,805
CARRIAGE AND COUPLING ARRANGEMENT FOR A DOCUMENT COPYING MACHINE

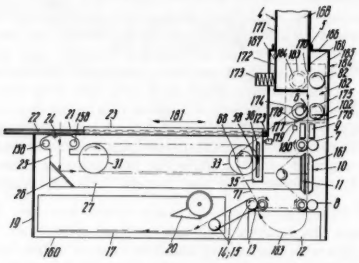
Walter Limberger, deceased, late of Hamburg, Germany, by Jurgen Limberger, heir, Hamburg-Poppenbuttel, Germany; by Ursula Limberger, heir, Hamburg-Poppenbuttel, Germany; Francois Prick van Wely, Travenberg, Germany, and Uwe Winzentsen, Hamburg, Germany, assignors to Lumoprint Zindler KG, Hamburg, Germany

Filed Apr. 16, 1973, Ser. No. 351,288

Claims priority, application Germany, Apr. 20, 1972, 2219307

Int. Cl.² G03G *15/28, 15/32*

U.S. Cl. 355—8 **12 Claims**



1. A copying machine for producing a copy or copies from an original, comprising a reciprocally movable carriage on which a document original is arranged to be laid, chain drive means for said carriage including an endless circulating chain and a pair of spaced sprocket wheels over and between which said endless circulating chain travels in a pair of sections with said chain reversing direction as it passes around said sprocket wheels from one section to the other, means for releasably coupling said carriage to said chain drive means so that said carriage can be reciprocated in a back and forth direction and can be uncoupled from said chain drive means at the opposite ends of its reciprocal movement, a stack holder for sheet-form copy material, a scanning device which includes a scanning aperture in the path of movement of the carriage, an exposure station which includes an exposure aperture in the path of the copy material, a copy sheet charging device, a copy sheet developing device, a copy sheet drying device, and means for unidirectionally driving said chain drive means around said sprocket wheels so that said endless circulating chain is continuously driven in a single direction about said sprocket wheels with said means for releasably coupling said carriage arranged to move said carriage in the back and forth direction and said means for unidirectionally driving said chain means arranged for moving the sheet-form copy material, said means for driving said chain drive means includes only one driving motor for all the movable parts and the copy sheet guide path is arranged in relation to the movement of the carriage so that a copy sheet traverses the whole copy sheet guide path during one back and forth movement of the carriage.

3,918,806
DASHPOT FOR COPIER OPTICAL SCANNING

John H. Cook, Sawbridgeworth, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1974, Ser. No. 514,357

Claims priority, application United Kingdom, Nov. 6, 1973, 51439/73

Int. Cl.² G03G *15/28;* **G03B** *27/50*

U.S. Cl. 355—8 **10 Claims**

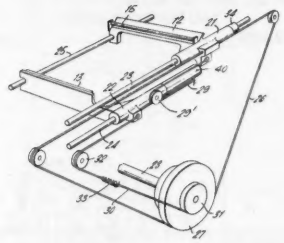
1. In a photocopying machine with an optical scanning carriage mounted for movement on a tubular mounting member and a pneumatic dashpot for said carriage the improvement comprising:

a cylinder and mateing piston both mounted on said tubular member, one slidably and the other in fixed relation thereto,

said tubular member defining a pneumatic chamber vented to atmosphere by a venting aperture therein;

said cylinder having a closed end wall;

said piston having a piston air stroke relative to said cylinder driven by said movement of said carriage extending to an end position spaced from said cylinder end wall;



said end position of said piston corresponding to a defined end position of movement of said optical scanning carriage on said tubular member; and

said tubular member having a second aperture communicating between said cylinder and said pneumatic chamber,

said second aperture being located intermediate said cylinder end wall and said piston for said entire air stroke.

3,918,807
CLEANING BLADE FOR PHOTOCOPIER

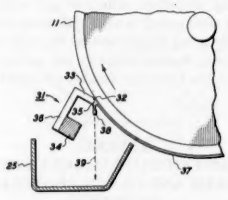
Stephen C. P. Hwa, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,535

Claims priority, application United Kingdom, June 29, 1973, 31045/73

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **6 Claims**



1. In an electrostatographic reproducing apparatus comprising a movable support surface having a portion moving in operation in a given direction, means for forming a latent electrostatic image on said surface, means for developing the latent image with liquid developer, means for transferring the developer image onto a sheet of transfer material and a drive mechanism to move the support surface past said means in succession, the improvement comprising a cleaning apparatus for removing liquid developer from the support surface comprising a scraper blade with an upper stem portion adapted to be mounted as a scraper blade in contact with the support surface, said upper stem portion having a drip tip for deflecting said liquid developer away from said surface, said drip tip being located adjacent said point of contact of the upper stem portion with said surface, said upper stem portion extending substantially opposite said given direction to the point of contact of the upper stem portion with the support surface, and a lower stem portion extending towards the upper stem portion in a direction toward the support surface until it intersects and forms an angle with the upper stem portion, the

lower stem portion being mounted to a support block at the end opposite said intersection.

3,918,808

PHOTORECEPTOR CLEANING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS OF THE DRY CLEANING AGENT TYPE

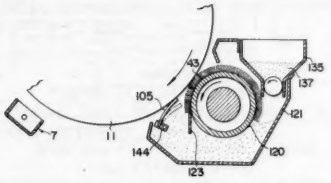
Teruo Narita, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,435

Claims priority, application Japan, Dec. 21, 1972, 47-128932; Apr. 18, 1973, 48-46103

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **5 Claims**



1. In electrophotographic copying apparatus of the dry toner image transfer type, in combination,

a. a photoreceptor unidirectionally movable along a closed endless path and undergoing two complete revolutions around said path during each cycle of copying operation; and

b. means, disposed in succession along said path so as to be traversed successively by said photoreceptor during each complete revolution thereof around said path, for erasing charge from said photoreceptor, charging said photoreceptor, exposing said photoreceptor in charged condition to form an electrostatic latent image thereon, developing the electrostatic latent image on said photoreceptor, and transfer printing the developed image;

wherein the improvement comprises:

c. said charging, exposing, and transfer printing means comprising means for charging said photoreceptor, forming a latent image thereon and transfer printing a developed image only once in each cycle of copying operation, during only the first of the two successive revolutions of said photoreceptor around said path constituting said cycle, and being inoperative during the second of said two successive revolutions constituting said cycle;

d. said erasing means comprising means for erasing charge from said photoreceptor at least during the second of said two successive revolutions of said photoreceptor such that said photoreceptor traverses said developing means in charged condition during said first revolution and in charge-erased condition during said second revolution in each cycle of copying operation; and

e. said developing means comprising a magnetic brush for transferring dry toner particles to said photoreceptor to develop an electrostatic latent image thereon when said photoreceptor traverses the developing means in charged condition and for removing residual toner particles from said photoreceptor to clean said photoreceptor when said photoreceptor traverses the developing means in charge-erased condition, such that said magnetic brush develops an image on the photoreceptor during the first, and cleans the photoreceptor during the second, of the two successive revolutions of the photoreceptor constituting one cycle of copying operation.

3,918,809

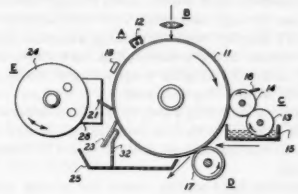
APPARATUS FOR CLEANING A SURFACE SUPPORT

Stephen C. P. Hwa, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 24, 1974, Ser. No. 482,726

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **3 Claims**



1. In an electrostatographic reproduction apparatus having a movable support surface having a portion moving in operation in an upward direction, means for forming a latent electrostatic image on said surface, means for developing the latent image with liquid developer, means for transferring the developed image to a sheet of transfer material, a drive mechanism to move the support surface past said means in succession, the improvement comprising cleaning station means for removing liquid developer and debris from the support surface, said cleaning station having at least one scraper blade adapted to engage the support surface on said upwardly moving portion, said scraper blade being a blade having a stem ending in a tip portion in contact with the support surface, the stem extending toward the tip in the upstream direction of the movement of the support surface and exerting a chiselling action on the support surface when pressed against the surface, and a wiper blade action on the support surface upstream of the scraper blade, said wiper blade being a blade having a stem extending in the downstream direction of the support surface.

3,918,810

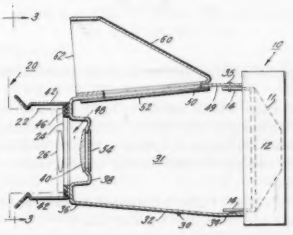
AMBIENT LIGHT EXCLUDING CAMERA ADAPTER WITH VIEWING HOOD

David A. Cohen, Hauppauge, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,536

Int. Cl.² G03B *29/00*

U.S. Cl. 355—18 **6 Claims**



1. In combination, an adapter for enabling camera photographing and simultaneous viewing of a CRT display, a CRT display means, and a camera;

said adapter comprising a light impervious hollow sleeve defining a space within it and having one open end to communicate with a CRT display and another open end to communicate with the lens of a photographic camera; said sleeve having at least one side; a viewing port through said side of said sleeve; said port being positioned to permit direct viewing of the CRT display by looking

directly through said port and through said sleeve one open end; a first light filter interposed to be between said viewing port and said sleeve space and a second light filter interposed in the space between said open ends of said sleeve having only said second light filter therein as a light attenuation means; said first filter being of one light subtractive color and said second filter being of a complementary light subtractive color, thereby to prevent ambient light which passes through said viewing port to pass through said space into said camera;

said CRT display means including a screen; said CRT display means being positioned at said sleeve one opening with said CRT display means screen being directed inwardly to said sleeve space;

said camera including a lens that is positioned at said sleeve other opening with said lens being directed inwardly to said sleeve space and toward said CRT display means screen;

and ambient light sealing means for joining said CRT display means to said sleeve at said one opening and for joining said camera to said sleeve at said other opening; said CRT display means comprising a slow scan television whose said screen displays an image having a yellowish color;

said first filter being blue in color and said second filter being amber in color.

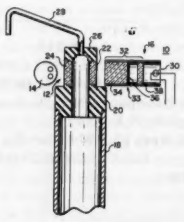
3,918,811
OPTICAL SYSTEM

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Division of Ser. No. 339,570, March 9, 1973, Pat. No. 3,866,049. This application Oct. 7, 1974, Ser. No. 512,189

Int. Cl.² G01N 21/34

U.S. Cl. 356—51 **29 Claims**



1. An optical system for measuring absorbance of light, comprising:

an optical filter which transmits light of a first wavelength from a first end of the optical filter in response to light of a second wavelength entering a second end of the filter;

a source of light of said second wavelength;

a flow cell;

said source of light being positioned on the opposite side of said flow cell from said optical filter;

means for detecting the intensity of said first wavelength of light emitted from said first end;

said optical filter including a transparent matrix and a plurality of small phosphor particles imbedded in the transparent matrix;

said phosphor particles having an excitation spectrum into which said second wavelength falls and an emission spectrum into which said first wavelength falls;

said transparent matrix having a refractive index greater than that of air and less than that of said small particles, whereby said phosphor particles scatter light and said transparent matrix reduces the backscattering of light.

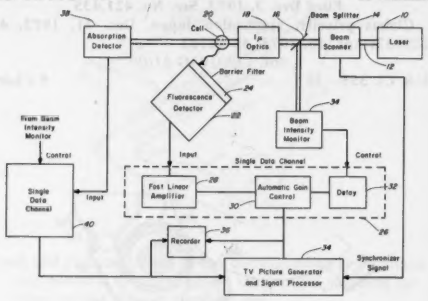
3,918,812
DIAGNOSES OF DISEASE STATES BY FLUORESCENT MEASUREMENTS UTILIZING SCANNING LASER BEAMS

Dale M. Holm, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 7, 1973, Ser. No. 357,758

Int. Cl.² G01N 21/38

U.S. Cl. 356—73 **15 Claims**



8. A method for producing an output representative of antibodies or antigens in a biological cell containing at least one dye which renders some of the antibodies or antigens light absorbent at selected wavelengths and other antibodies or antigens fluorescent at particular wavelengths in response to light of preselected wavelengths incident on such dye responsive antibodies or antigens, the method comprising the steps of:

moving the cell in a first direction;

producing a light beam having a diameter substantially smaller than the cross section of the cell;

moving the light beam in a second direction essentially perpendicular to the first direction of movement of the cell to produce an X-Y scan across the cell;

detecting the light fluoresced by the dye responsive antibodies or antigens and producing a first output representative thereof;

determining the light absorbed by the dyed antibodies or antigens within the cell and producing a second output representative thereof; and

generating a display in response to the first and second outputs representative of the dye responsive antibodies and antigens in the cell.

3,918,813
OPTICAL COLLIMATING ALIGNMENT UNITS

Michael Weston Rossiter, Salisbury, Australia, assignor to The Commonwealth of Australia, Parkes, Canberra, Australia

Filed Mar. 25, 1974, Ser. No. 454,378

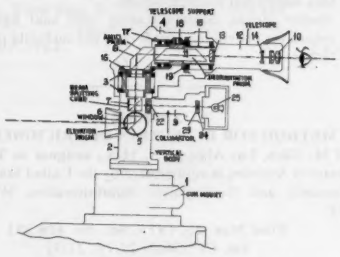
Claims priority, application Australia, Mar. 28, 1973, 2779/73

Int. Cl.² G01B 11/26

U.S. Cl. 356—153 **8 Claims**

1. An optical collimating alignment unit comprising a main body, an optical viewing system associated with said body including a viewing window and a telescope and prisms directed to produce an image at a field lens of the telescope viewable through an eyepiece, support means supporting said optical viewing system on said main body to provide relative rotation therebetween, a beam splitting cube located in said optical viewing system near said window, a collimator on said main body optically directed towards said beam splitting cube, said collimator having an axis normal to the axis of the viewing system at the cube and said cube having a face opposite to the collimator which is reflective, said collimator including an

illuminated graticule whereby said collimator produces, at the field lens a datum image of the graticule direction through the

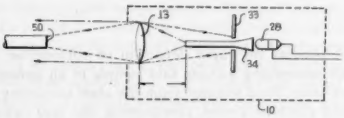


same optical viewing system as the image which is viewed through the said window.

3,918,814
OPTICAL POSITION SENSOR

Sidney Weiser, Silver Spring, Md., assignor to Weiser/-Robodyne Corporation, Silver Spring, Md.

Filed May 13, 1974, Ser. No. 469,708
Int. Cl.² G01B *11/00*
U.S. Cl. 356—156 **17 Claims**



1. An optical position sensor for determining the position of an object, said sensor being characterized by a common housing for all sensor components and including:

a low power lamp;

a tapered fiber optic pipe having a wider end positioned adjacent said lamp to receive light emitted from said lamp, the opposite end of said pipe being narrow such that light from said lamp has a greater flux density at said narrow end than at said wider end;

a lens system having a point of principal focus and a predetermined optical axis, said lens system positioned relative to said fiber optic pipe such that the narrow end of said pipe resides at the principal focus of said lens system, said lens system being arranged to collimate substantially all of the light emitted from the narrow end of said pipe into a sensing beam directed out of said housing and imaged substantially at infinity; and

a photo-sensitive detector positioned within said housing to intercept light reflected from said object back through said lens system and into said housing, said photo-sensitive detector including means for providing electrical signals indicative of the position of said object.

3,918,815
DENSITOMETER FOR MEASURING AVERAGE APERTURE DIAMETER

George Simon Gadbois, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 495,067
Int. Cl.² G01B *11/28*
U.S. Cl. 356—157 **13 Claims**

1. In an apparatus for producing a signal manifesting the average aperture diameter of an apertured member by the measurement of light transmission through said member, said apparatus including:

a. means for producing a light beam,

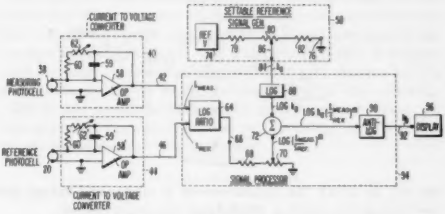
b. means for dividing said beam into a measuring beam and a reference beam,

c. a reference photocell disposed to receive said reference beam for producing a reference signal s_{ref},

d. a measuring photocell disposed to receive said measuring beam passed through a plurality of said apertures in said member for producing a measuring signal t_{meas} manifesting the intensity of said passed measuring beam, the combination therewith comprising:

means for providing a settable reference signal k_a representing the spacing of said plurality of apertures, and

signal processing means responsive to said reference signal s_{ref}, measuring signal t_{meas} and said settable reference signal k_a applied as inputs thereto for providing as an output therefrom a signal h_b manifesting the average diameter of said plurality of apertures in accordance with the relationship



$$h_b = k_a \left(\frac{t_{meas}}{s_{ref}}\right)^{1/2}$$

3,918,816
TIRE INSPECTION APPARATUS

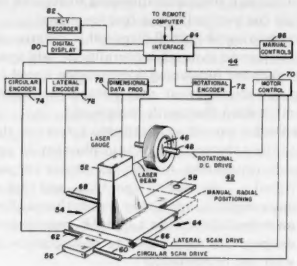
George B. Foster, Worthington, and Donald L. Cullen, Columbus, both of Ohio, assignors to Autech Corporation, Columbus, Ohio

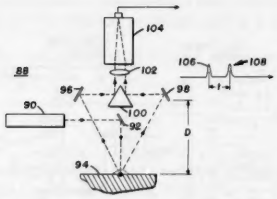
Filed Apr. 22, 1974, Ser. No. 463,147
Int. Cl.² G01B *11/00*
U.S. Cl. 356—167 **32 Claims**

1. A method for non-destructively inspecting the geometry of a tire comprising the steps of: mounting a tire to be inspected for rotation about its axis, transmitting a narrow energy beam through the atmosphere for impingement on a selected portion of the tire surface; recovering a portion of said beam returning from the point of impingement; analyzing said recovered beam portion to develop an electrical signal analog representative of the location in space with respect to a reference location of a selected portion of the tire surface for a particular rotation position; controllably selecting the measurement location; and controllably rotating said tire to allow inspection at any location on the tire surface.

17. Apparatus for non-destructive inspection of the dimensions of a tire comprising: a first mounting fixture for rotatably supporting a tire to be inspected; a gauging system including means for transmitting a narrow beam of energy through the atmosphere for impingement on the surface of a tire mounted in said fixture, means to recover energy returning from said point of impingement, and means for developing an electrical signal representative of said point of impingement responsive to said recovered energy; a second mounting fixture for the

measuring portion of said gauging system; drive means for moving said second mounting fixture to select the position on





the tire at which the measurement is made; and means for controlling the rotation of said tire mounting fixture.

3,918,817

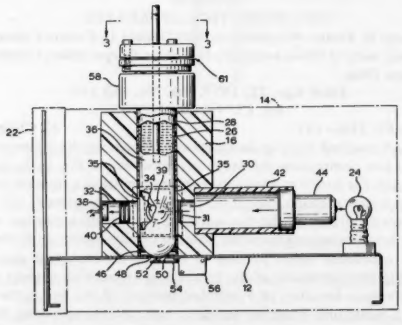
TURBIDIMETERS

Edward S. Posgate, Brampton, Canada, assignor to Wacan Hydro-Flow Ltd., Rexdale, Canada

Continuation-in-part of Ser. No. 361,060, May 17, 1973, abandoned. This application Feb. 1, 1974, Ser. No. 438,622

Int. Cl.² G01N *21/24*

U.S. Cl. 356—208 **18 Claims**



1. A turbidimeter comprising

a. receiver means for receiving a liquid sample to be tested,

b. thermal insulating housing means having first passage means therein for receiving said receiver means in a close fitting sliding relationship whereby the clearance between the receiver and the housing is so small as to prevent condensation forming on the surface of the receiver,

c. sealing means at the upper and lower ends of said first passage to seal said passage closed when a receiver means is located therein,

d. additional passage means in said housing opening into said first passage means,

e. light source means and light sensing means aligned with said additional passage means,

f. reader means communicating with said light sensing means for providing a reading of the turbidity of a sample tested.

3,918,818

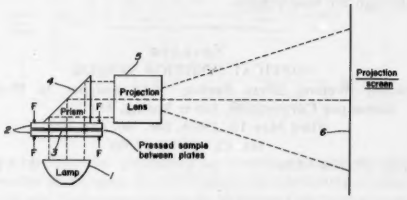
METHOD FOR DETECTION OF TRICHINELLAE

Paul M. Giles, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,391

Int. Cl.² G01N *21/16, 21/32*

U.S. Cl. 356—239 **4 Claims**



1. A process for rapid detection of trichinellae in meat samples comprising wetting said sample in an enhancing refractive-index fluid selected from the class consisting of glycerol and ethylene glycol, compressing the said sample in a press, mounting the compressed sample between glass slides coated with the said fluid, and projecting the sample's image by a projection means.

3,918,819

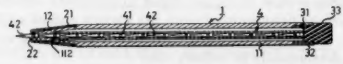
WRITING IMPLEMENT

Hsing-Ching Liu, Taipei, Taiwan, assignor to Kent Industrial Corporation, Taipei, Taiwan

Filed Aug. 22, 1974, Ser. No. 499,604

Int. Cl.² B43K *21/16*

U.S. Cl. 401—57 **5 Claims**

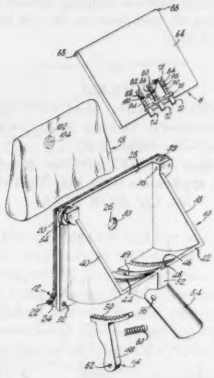


1. Writing implement comprising an outer barrel having a split clamp front end, an inner tube mounted inside the barrel having a plurality of pencil lead stubs therein, each lead stub having a bullet-like body with a tip in front and a ring groove around it and a base, the said clamp end of the barrel having a projection portion in front to engage with the ring groove of the lead stub, the clamp end of the barrel being enclosed by a cap screwed on the barrel, an aperture in front of the cap for the projection of the tip of the frontmost lead stub in said tube, a protruded portion formed on the inner circumference of the said aperture and disposed to contact the outside clamp wall, whereby when the cap is screwed tight the protruded portion actuates the barrel clamp end to grip the frontmost lead stub for writing and when the cap is screwed loose it permits the barrel clamp end to free the frontmost lead stub for rejection from and retraction into the barrel without hampering the lead adjacent to it.

3,918,820
PAINT APPLICATOR

Dae Sik Kim, 23 Hearthstone Drive, Medfield, Mass. 02052

Filed Sept. 5, 1974, Ser. No. 503,254
Int. Cl.² A46B 1/00
U.S. Cl. 401—152 7 Claims



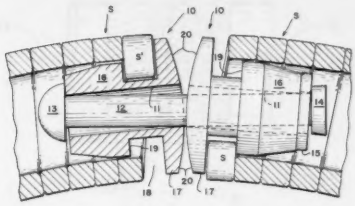
1. A paint device for use with a paint-applying pad having a hole for passage of paint therethrough and a flexible paint container having a discharge outlet, which paint device comprises 1) a casing for holding the flexible paint container, and casing having a face for support of the paint-applying pad, said face having an outlet orifice positioned for alignment with the hole in the paint-applying pad and the discharge outlet of the paint container; a circular wall opposite the interior surface of the face and extending from the lower section thereof; a covered plate adapted to swing within the confines of the casing for applying pressure upon the flexible paint container to force paint through the discharge outlet; and a channel situated in the curved wall of the casing; 2) a ratchet member slidably mounted in the casing wall channel and positioned to urge the cover plate inward toward the outlet orifice; 3) a finger-actuated trigger member which is an outward extension of the ratchet member; 4) a gripping handle facing the trigger member; 5) a compression spring abutting the trigger member for applying a force thereon which is transmitted to the ratchet member for urging the cover plate inward toward the outlet orifice, and spring positioned so that movement of the trigger member toward the gripping handle compresses the spring and increases the inward force applied upon the cover plate upon release of the trigger member; and 6) means for retaining the cover plate upon movement of the trigger member toward the gripping handle.

3,918,821
ARTICULATED CONNECTOR

William L. Schlegel, Stanhope; Joseph E. Grabarczyk, Gladstone, and Robert J. Krihak, Stanhope, all of N.J., assignors to Komline-Sanderson Engineering Corporation, Peapack, N.J.

Filed June 14, 1974, Ser. No. 479,578
Int. Cl.² B01D 33/14
U.S. Cl. 403—57 3 Claims

1. An articulated coupling for coil springs comprising: a pair of unitary coupling bodies formed with normally aligned bores therethrough; a connecting pin extending loosely through said bores and having enlargements at its opposite ends for retaining the bodies on said pin, said bodies being relatively rotatable and capable of limited relative angular movement in an axial plane of said pin; said bodies being coaxial with their respective bores and respectively including plugs at their relatively remote ends having external diameters less than the internal diameters of said coil springs for free axial reception in the respective coil springs, and flanges at the relatively adjacent ends of said bodies, each said body being encircled by an annular groove between its said plug and its said flange of a width substantially equal to the width of a single coil of said spring for reception and axial retention of a radially inwardly directed terminal end of a coil of said spring, said plugs respectively presenting annular shoulders defining side walls of their said grooves for endwise abutment with said

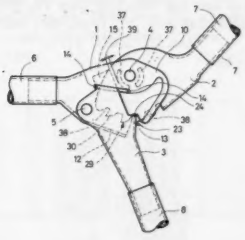


terminal coil spring ends to retain said coil springs axially on the plugs; the diameters of said flange being greater than the diameters of the respective plugs for endwise abutment with the respective springs during assembly of the couplings to said springs, whereby to locate said grooves accurately in registry with the said terminal spring ends and said flanges have a maximum combined width and configuration that continuously bridge substantially the entire axial distance between the interconnected terminal ends over the entire range of coupling articulation.

3,918,822
ADJUSTABLE JOINT

Gunter Rauschenberger, Gartenstrasse, 744 Asperg, Germany

Filed Nov. 22, 1974, Ser. No. 526,370
Claims priority, application Germany, Nov. 23, 1973, 2358332
Int. Cl.² F16C 11/00; F16D 1/12
U.S. Cl. 403—62 28 Claims

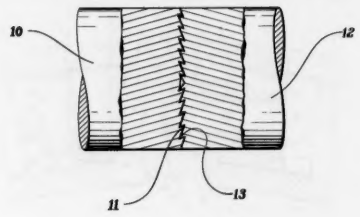


1. In an assembly of the character described having at least three mutually adjustable parts, a combination comprising a joint including a first, a second, and a third joint member connected to the three parts of the assembly, respectively, each of said second and third joint members being connected to said first joint member for a pivoting movement with respect thereto about a respective one of two spaced parallel axes between a folded position and an extended position through a plurality of intermediate positions; detent means on said second joint member; and arresting means sharing the pivoting movement of said third joint member at least between a predetermined one of said intermediate positions and said extended position of said third joint member, and operative for engaging said detent means during said shared pivoting movement so as to arrest said second joint member in a selected one of said intermediate positions of said second joint member at least when said third joint member is in said extended position thereof, and for releasing said detent means upon return of said third joint member into said one intermediate position of the latter.

3,918,823
THREADED STRUCTURE

Alexander Wilson, 4820 Thunderbird Circle, Apartment 306, Boulder, Colo. 80303

Filed Oct. 11, 1974, Ser. No. 513,918
Int. Cl.² F16B 7/18
U.S. Cl. 403—343 5 Claims

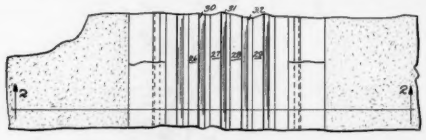


1. A threaded structure, comprising: a first substantially flat surface having undercut threads defined therein in the form of at least a portion of a substantially planar spiral with the undercut oriented towards the center of the spiral; and a second substantially flat surface having undercut threads defined therein complementary to the threads defined in the first surface and in the form of at least a portion of a substantially planar spiral with the undercut oriented away from the center of the spiral, the undercuts of the threads defined in the first and second flat surface, respectively, being at different angles, whereby the first and second surfaces may be positioned together with the threads engaging and, through a minor relative rotation, secured together with substantially no axial takeup and engaging in an interference fit.

3,918,824
EXPANSION JOINT SEAL

Thomas C. Bowman, Buffalo, N.Y., assignor to Watson-Bowman Associates, Inc., Buffalo, N.Y.

Continuation of Ser. No. 380,675, July 19, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,761
Int. Cl.² E01C 11/10
U.S. Cl. 404—64 4 Claims



1. A preformed elastomeric seal for an expansion joint comprising an elongated tube which, in cross section, comprises

a pair of heart-shaped members, connected to each other in side-by-side relationship, each of said heart-shaped members having

1. an undulating upper surface including a pair of ribs (30, 32) extending upwardly and outwardly from the bottom of a shallow grove (39, 40) extending downwardly from a middle position at the top of said seal, and ribs extending downwardly and outwardly from the upper ends of said upwardly and outwardly extending ribs (43, 44, 31) to the bottoms of shallow grooves extending downwardly from the top of said seal adjacent said heart-shaped members,

2. a pair of legs (33, 34, 35, 36) extending upwardly and outwardly from the bottom of said heart-shaped member and connected at their distal ends to the ends of said downwardly and outwardly extending ribs, whereby there is a deep groove between the lower portions of said heart-shaped members, and

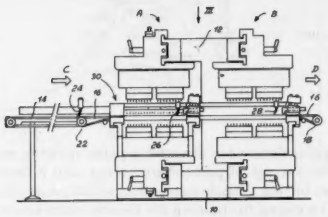
3. vertical ribs (37, 38) connecting between the bottom of said first-mentioned shallow grooves and the junction of said legs at the bottom of said seal,

and a rib (25) connecting the bottoms of said heart-shaped members to reduce their tendency to be pressed together thereby reducing upward bulging of said seal, said bottom-connecting rib and portions of said legs forming the bottom of said tube.

3,918,825
MULTIPLE WOODWORKING MACHINE AND METHOD

Luigi Alberti, c/o Alberti Vittorio S.p.A., Via Cavour, 75, 20063 Cernusco S.N., Milan, Italy

Filed May 14, 1973, Ser. No. 360,357
Claims priority, application Italy, May 20, 1972, 24627/72
Int. Cl.² B23B 39/18
U.S. Cl. 408—43 5 Claims



1. A woodworking system, particularly for drilling holes into wooden workpieces, comprising an upstream working station and a downstream working station arranged along a path; supply means supplying a series of workpieces for travel in said path; a single continuous conveyor positioned to receive said workpieces from said supply means in pairs which are each composed of a leading and a trailing workpieces, for conveying each of said workpieces sequentially through said upstream station and thereupon through said downstream station; first stop means for arresting the leading workpiece of each pair at said downstream station; second stop means for arresting the trailing workpiece of each pair at said upstream station in response to operation of said first stop means; means for simultaneously machining the workpieces located at said upstream and downstream stations, and for thereafter discharging these workpieces from said stations; blocking means for blocking the admission of additional workpieces from said supply means onto said conveyor in response to operation of said first and second stop means; means for deactivating said stop means and said blocking means upon termination of machining of said workpieces; and means for re-activating said first stop means in response to the exiting of the respective trailing workpiece of each pair from said downstream station.

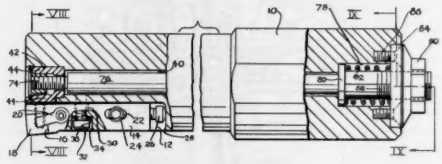
3,918,826
BORING TOOL HAVING RETRACTABLE CARTRIDGE

Ernest J. Friedline, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 22, 1974, Ser. No. 499,448
Int. Cl.² B23B 29/14
U.S. Cl. 408—154 10 Claims

1. In a boring tool; a support bar having a forward end and a rearward end, a lateral notch formed into the side of the bar at the forward end, a cartridge in said notch having a longitudinal axis and formed with a pocket for a cutting insert at the end nearest said forward end of the bar and on the radially outer side of the cartridge, said pocket having a bottom wall for supporting a cutting insert disposed in said pocket, con-

necting means spaced longitudinally along the cartridge from the pocket end thereof connecting the cartridge to the bar, radially acting cam and follower means in said bar adjacent said notch at said forward end thereof operatively engaging the cartridge near the pocket end thereof and adjustable longitudinally of said bar for effecting radial adjustment of the



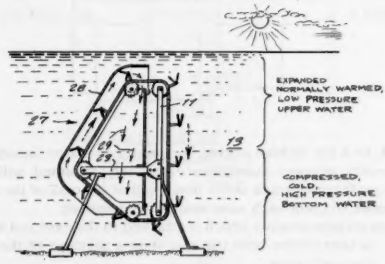
pocket end of the cartridge on said bar in a direction substantially parallel to said bottom wall of said pocket, adjustable means extending axially through said bar and connected to said cam and follower means for effecting adjustment thereof, and resilient means acting on said cartridge between said pocket end thereof and said connecting means, and biasing the cartridge in the radially inward direction on said bar.

3,918,827

FUEL LESS WATER PRESSURE MACHINE

John L. Conn, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 19, 1974, Ser. No. 525,056
Int. Cl.² F03G 3/00, 7/00, 7/10
U.S. Cl. 415—5 **3 Claims**



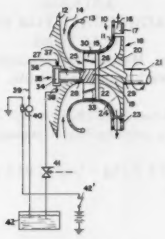
1. In a fuel-less water machine, the combination of an upright very tall frame submerged underwater in an ocean, sea or the like, said frame supporting a set of cog wheels freely rotatable about shafts mounted on said frame, said cog wheels supporting an endless chain, a plurality of buckets supported around said chain, each said bucket being comprised of four hollow panels containing sealed air so to provide bouyancy, two of said panels being larger than the others and being pivotable a limited distance about a cross pin affixed on said chain, and the other of said panels are each pivotally attached on an outer end of each said larger panels so to likewise pivot a limited distance, and said frame including a sideward arm on one side and along an intermediate portion thereof, said side arm supporting one of said cog wheels on its outer end, whereby one side of said chain located between an uppermost and lowermost said cog wheels is longer than on its other side.

3,918,828

FLOW CONTROL FOR COMPRESSORS AND PUMPS

Emerson L. Kumm, 1035 E. Laguna Drive, Tempe, Ariz. 85282

Filed Sept. 5, 1974, Ser. No. 503,469
Int. Cl.² F01D 1/24
U.S. Cl. 415—61 **7 Claims**



1. Flow control means for compressors and pumps of the type having a casing with an inlet, an outlet, and an impeller supported for rotation between said inlet and outlet to draw fluid into said inlet and discharge it from said outlet, said flow control means comprising:

a. guide means mounted in the casing between said impeller and the inlet, said guide means being supported for rotary movement and having vanes engaged by fluid flowing to said impeller to impart direction to such fluid; and

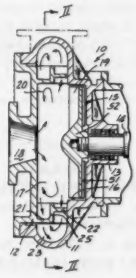
b. fluid pressure responsive means disposed exteriorly of said casing for controlling the rotary movement of said guide means to obtain a predetermined speed ratio range relative to said impeller.

3,918,829

LOW PRESSURE-PULSE KINETIC PUMP

Walter Anthony Korzec, West Warren, Mass., assignor to Warren Pumps, Inc., Warren, Mass.

Filed June 19, 1974, Ser. No. 480,977
Int. Cl.² F04D 29/66, 29/44
U.S. Cl. 415—119 **3 Claims**



1. A centrifugal pump comprising:

an intake port casing having at least two circumferential rows of diffuser vanes spaced radially outwardly from an axis of said casing,

the vanes having inner leading edges forming a free vortex chamber radially inwardly thereof and axially adjacent said intake port casing,

the rows of vanes being separated each from another by an annular, radially-extending surface,

the vanes on either axial side of said surface being staggered circumferentially with respect to one another, and

the rows of diffuser vanes being formed integrally with said intake port casing; and

a rotatable impeller recessed axially in an impeller chamber formed in a second casing part adjoining said free vortex chamber,

thereby to reduce pump noise and pump output pressure pulse magnitude.

3,918,830

MOTOR-PUMP AGGREGATE FOR USE IN NUCLEAR REACTORS

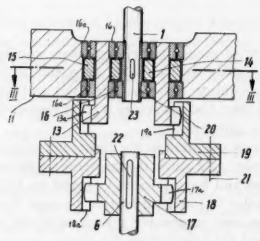
Wolfgang Schneider, Hessheim, Germany, assignor to Sulzer KSB Kernkraftwerkspumpen GmbH, Frankenthal, Pfalz, Germany

Filed June 4, 1973, Ser. No. 367,013

Claims priority, application Germany, June 6, 1972, 2227357

Int. Cl. F16d *67/02*; **F01d** *15/12*

U.S. Cl. 415—122 **8 Claims**



1. An aggregate, particularly for use in nuclear reactor plants, comprising a prime mover having an output shaft rotatable in a predetermined direction; a fly wheel fixed to said output shaft for rotation therewith; a pump having a second shaft coaxial with said output shaft; torque transmitting means between said shaft including a coupling having a first flange on said output shaft, a second flange on said second shaft, means for rotating said second flange in response to rotation of said first flange in a predetermined direction, and overrunning clutch means interposed between one of said flanges and the respective shaft and arranged to permit rotation of said second shaft relative to said output shaft when the speed of said second shaft in said predetermined direction exceeds the speed of said output shaft; a stationary support; first antifriction bearing means interposed between said stationary support and said one flange; and second antifriction bearing means interposed between said one flange and the respective shaft.

3,918,831

CENTRIFUGAL PUMP WITH VARIABLE IMPELLER

Charles W. Grennan, Newington, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 8, 1974, Ser. No. 439,845

Int. Cl.[2] **F03B** *15/04*; **F01D** *7/00*

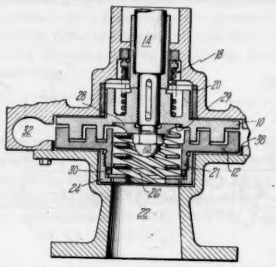
U.S. Cl. 415—131 **7 Claims**

1. In a radial flow centrifugal pump, said pump having a drive shaft and a housing which defines an axial inlet and a collector for receiving a fluid being pumped, means for varying the pump capacity comprising:

a driver impeller coupled to the pump drive shaft, said driver impeller including a base member having a plurality of vane defining projections on a first face thereof;

a driven impeller, said driven impeller including a base member having a plurality of vane defining projections on a first face thereof, said driven impeller being positioned with the vanes thereof facing and engaging the vanes on said driver impeller whereby said impellers define multiple cascades of flow channels which discharge into the common pump collector; and

means including an inducer spring positioned within the assembly defined by said driver and driven impellers for



varying the axial relationship between said impellers, said spring inducing flow into said flow channels and cooperating with said driver and driven impellers to establish a preselected impeller flow area at a given back pressure.

3,918,832

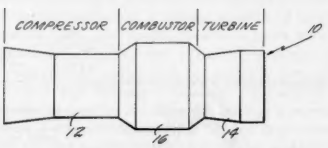
STATOR CONSTRUCTION FOR AN AXIAL FLOW COMPRESSOR

Richmond G. Shuttleworth, Vernon, and Donald L. Williams, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 29, 1974, Ser. No. 492,574

Int. Cl.[2] **F01D** *25/24*; **F04D** *19/02*

U.S. Cl. 415—217 **9 Claims**



1. In a gas turbine engine, a compressor stator including a plurality of vane assemblies detachably mounted within a circumferential track in the inner wall of the case of the compressor wherein each vane assembly comprises:

an arcuate retainer which is attached to the case and which is coextensive with the case over a segment of the case circumference;

at least one vane having a base including a retaining slot which is slidably engaged by the arcuate retainer, the vane extending radially inward from the retainer toward the center of curvature of the retainer; and

a first end plate attached to one end of the arcuate retainer for preventing the circumferential rotation of the vanes around the track in the inner wall.

3,918,833

CIRCULATION CONTROL ROTOR HUB USING TEACUP CAM AND PUSHROD VALVES

Warren H. Eilertson, 3931 L'Enfant Drive, Fort Washington, Md. 20022

Filed Jan. 11, 1974, Ser. No. 432,796

Int. Cl.[2] **B64C** *27/18*, *15/08*

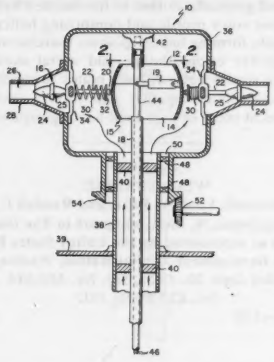
U.S. Cl. 416—20 **4 Claims**

1. A circulation control rotor comprising:

a hub;

a plurality of hollow blades attached to said hub;

cam operated poppet valves at the entrances to said hollow blades;



a plurality of cams on a shaft within said hub which operate said valves; and

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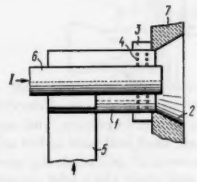
3,918,834

METHOD OF REDUCING THE CONCENTRATION OF NITROGEN OXIDES IN A GASEOUS EFFLUENT FROM A THERMAL PLANT

Isaak Yakovlevich Sigal, ulitsa Ezhena Potie, 11, kv. 107; Georgy Fedorovich Naidenov, Saratovskaya ulitsa 39, kv. 21; Sergei Savatievich Nizhnik, ulitsa I. Sergienko, 23, kv. 60, and Nikolai Alexandrovich Gurevich, ulitsa Frunze, 118/2, kv. 13, all of Kiev, U.S.S.R.

Filed Aug. 9, 1973, Ser. No. 387,128
Int. Cl.² F23B *7/00*
U.S. Cl. 431—10 **2 Claims**



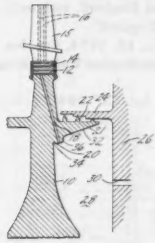
1. A method of reducing the concentration of nitrogen oxides in a gaseous effluent of the combustion in a thermal plant fitted with burners having axial passages, the method comprising the steps of burning a fuel in two stages within the same heat-receiving chamber of the thermal plant, under the conditions of oxygen deficiency in a high-temperature zone, the two-stage combustion being accomplished by redistributing the flow of the fuel and air inside the burners so that part of the air is introduced in a first, spiral flow at the periphery of the passages of the burners, and introducing the rest of the air, required for complete combustion of the fuel, in a second, straight-line flow directed along the axis of the burners, all of the fuel being introduced in a peripheral zone surrounding the axial passages, together with the first air flow, with which all fuel is intermixed, thereby causing a cone-shaped flame to emerge from the peripheral zone, constituting a first, high-temperature combustion stage, while the second air flow contributes to a second, lower-temperature combustion stage axially located with respect to but spaced at a distance from the first stage.

3,918,835

CENTRIFUGAL COOLING AIR FILTER

George J. Yamarik, Vernon, and Harold M. Craig, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,312
Int. Cl.² F01D *5/08*
U.S. Cl. 416—95 **7 Claims**



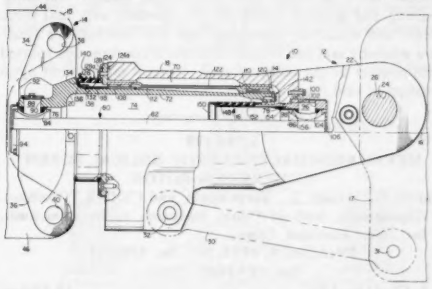
1. A rotor construction including:
a blade supporting disk having a rib on one side thereof concentric to the disk,
a plurality of blades on the periphery of the disk said blades having cooling passages therein,
a plurality of passages in said rotor extending radially outwardly from a point radially inwardly of the rib to the periphery of the disk to supply coolant to the passages in the blades,
said disk having projecting lips at the inlet end of each disk passage to minimize the entrance of foreign matter to the disk passages.

3,918,836

MAIN ROTOR ELASTOMERIC BEARING SEAL

Glenn E. Johnson, Fort Worth, and Martin H. Lufkin, Hurst, both of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Nov. 13, 1973, Ser. No. 415,302
Int. Cl.² B63H *3/00*; **B64C** *11/06, 11/12*; **F16C** *33/78*
U.S. Cl. 416—136 **11 Claims**



1. A device for rotatably attaching a blade to a mast of a helicopter comprising:
a. an elongated grip member having a mounting means at the outboard end for attachment to a rotor blade;
b. a spindle member having a mounting means at the inboard end for attachment to a mast, one of said members is hollow to define a chamber and the other of said members is of spindle structure for insertion into said chamber to form an annulus between said members;
c. coupling structure including bearing means positioned in said annulus between said members; and
d. flexible seal means positioned at the ends of said annulus, each said seal means spanning said annulus and having ends thereon, each said seal means having one end

thereof rigidly fixed to said grip member and the other end rigidly fixed to said spindle member to close said annulus for retention of lubricant therein for said bearing means.

3,918,837

BLADED ROTORS

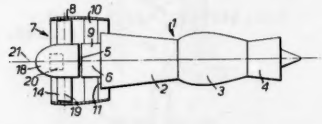
Michael Poucher, Cheltenham, and Ivor Harold Brooking, Gloucester, both of England, assignors to Dowty Rotol Limited, Gloucester, England

Filed Feb. 15, 1974, Ser. No. 443,145

Claims priority, application United Kingdom, Feb. 17, 1973, 7888/73

Int. Cl.² B64C *11/40*

U.S. Cl. 416—157 **15 Claims**



1. A bladed rotor comprising a hub, blades carried by the hub and mounted for adjustment about their longitudinal axes, a liquid-pressure-operable actuator carried by the hub for adjusting the blades to vary flow of fluid over the blades, at least one pump associated with the rotor which is capable of supplying liquid under pressure to said actuator, control valve means, disposed between said pump and said actuator, which comprise a positional control valve assembly and a condition control valve assembly operable the one assembly in conjunction with the other and each carried by said hub so as to be rotatable bodily as one therewith, a first input linkage connected to said positional control valve assembly and a second input linkage connected to said condition control valve assembly, said positional control valve assembly and said condition control valve assembly each comprising two co-operable elements which are relatively adjustable by their respective input linkages for appropriate control of flow of pressure liquid discharged by said pump to said actuator, drive means provided upon one of said elements of at least said condition control valve assembly and mechanical means, including shafting and gearing, which are co-operable with said drive means and which are connected fast with non-rotative structure whereby said one of said elements is continuously rotated with respect to the other of said elements consequent upon rotation of said rotor.

3,918,838

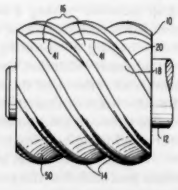
METAL REINFORCED PLASTIC HELICAL SCREW COMPRESSOR ROTOR

Harold W. Moody, Jr., Farmington, and Clifford T. Bulkley, Glastonbury, both of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jan. 4, 1974, Ser. No. 430,841

Int. Cl.² F04D *29/32*

U.S. Cl. 416—176 **18 Claims**



1. A helical screw compressor rotor comprising:

a central shaft,

a plurality of metal plates fixedly stacked on said rotor shaft in concentric fashion at axially spaced positions to form a metal skeleton, said plates having an outer periphery configured generally to that of the finished helical screw compressor rotor profile and comprising helical lobes of given pitch, forming helical grooves therebetween, and a plastic jacket encapsulating said metal skeleton, and filling the spaces between said plates to rigidly connect said spaced plates together and form a unitary, light weight, solid rotor of high load bearing capability.

3,918,839

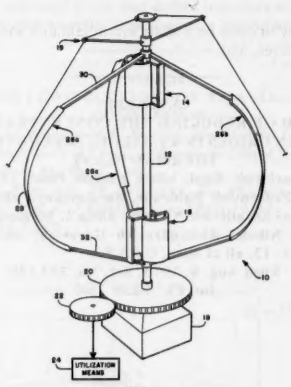
WIND TURBINE

Bennie F. Blackwell; Louis V. Feltz, and Randall C. Maydew, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 508,016

Int. Cl.² F03D *3/02*

U.S. Cl. 416—175 **16 Claims**



1. A wind turbine comprising a rotatable shaft; a drive rotor having an elongated blade with a central curved portion of airfoil shape transverse to said curvature, and means for supporting said blade on said shaft with said airfoil shape directed along the path of movement of said blade for exerting significant driving force on said shaft when said curved blade portion attains a linear velocity to wind velocity ratio greater than about three; starter rotor means disposed on said shaft having vanes out of registry with the curved portion of said drive rotor for rotatably accelerating said shaft to said velocity ratio; and means coupled to said shaft for utilizing the rotation of said shaft.

3,918,840

COMPRESSOR FOR GAS TURBINE ENGINES

Lional Haworth; David Bruce Foweraker, and Richard Armstrong Foster, all of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Apr. 18, 1974, Ser. No. 461,968

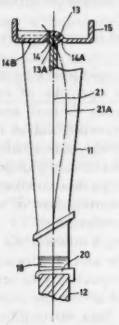
Claims priority, application United Kingdom, May 2, 1973, 20947/73

Int. Cl.² F01D *5/22*

U.S. Cl. 416—190 **2 Claims**

1. A compressor for gas turbine engines comprising a rotor body, an array of radial blades connected at their radially inner ends to the body, a circumferentially continuous shroud ring surrounding the blades at the radially outer ends thereof,

the blades having an elongate cross-section, a recess provided in a radially inner surface of the ring adjacent said outer end of each blade, the recess being elongate in the direction of elongation of the cross-section of said outer end, an extension provided at the outer end of each blade, the recess and extension being of curved cross-section as seen in said direction of elongation and the recess having sides which are divergent towards the blade to enable the extension to pivot relative to the recess and slide therefrom in consequence of bending forces on the blade.



3,918,841

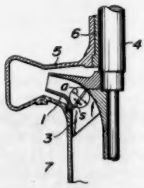
PUMP IMPELLER ASSEMBLY

Kazuo Kida, and Naokazu Kubota, both of Mishima, Japan, assignors to Dengyosha Machine Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 313,933, Dec. 11, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,788

Int. Cl.² F04D *1/06*

U.S. Cl. 416—183 **2 Claims**



1. A pump impeller assembly comprising, a centrifugal type main impeller, the blade inlet end portion of the main impeller being of generally eye-shaped configuration, a onestage front-impeller with at least two blades, said front impeller being disposed just in front of the main impeller relative to the flow direction of fluid through the assembly with the following relations:

$$0.1 \leqslant (s/a) \leqslant 0.6$$
$$0.7 \leqslant (l/c) \leqslant 1.25$$
$$0.2 \leqslant (h/t) \leqslant 0.6$$

where a is the diameter of the eye-shaped blade inlet end portion of the main impeller, s is the spacing from the blade inlet end of the main impeller to the blade outlet end of the front-impeller taken in the direction of line of flow through the assembly, t is the blade pitch of the main impeller at the blade inlet end thereof, h is the relative spacing between the inlet end of the blade of the main impeller and the outlet end of the blade of the front-impeller taken in the peripheral direction of the impellers, l is the front-impeller blade chord length in the meridian plane, and c is the pitch of the front-impeller blades at their outlet.

3,918,842

BLADE ASSEMBLY FOR A FLUID FLOW MACHINE

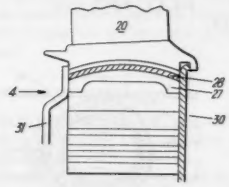
Peter John Longley, Hilton, and Anthony George Gale, Wollaton, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed June 3, 1974, Ser. No. 475,916

Claims priority, application United Kingdom, June 26, 1973, 30252/73

Int. Cl.² F01D *5/18, 5/24*

U.S. Cl. 416—219 **7 Claims**



1. A bladed rotor assembly for a gas turbine engine comprising a rotor and a plurality of angularly spaced apart aerofoil blades supported from the rotor, each blade having a platform member, said platform member having a face which cooperates with a corresponding face on the next adjacent blade to form a radially tapering groove whose width decreases as its distance from the rotor axis increases, said radially tapering groove being curved longitudinally relative said rotor assembly, and a sealing member mounted in the tapered and longitudinally curved groove so as to seal between the adjacent platforms, said sealing member comprising a wire curved longitudinally relative said rotor assembly and being substantially complementary to the longitudinal curve of said groove.

3,918,843

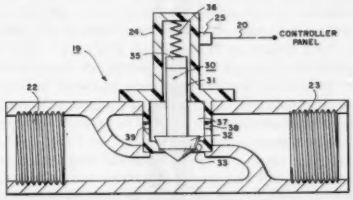
OIL WELL PUMPOFF CONTROL SYSTEM UTILIZING INTEGRATION TIMER

Bobby L. Douglas, Houston, and Robert C. Williams, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 20, 1974, Ser. No. 452,851. The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.² F04B *49/00*

U.S. Cl. 417—12 **16 Claims**



1. A system for controlling the operation of a well pumping installation including a pump, a motor for operating said pump, and a pumped fluid flowpipe, said well control system comprising:

differential pressure generating and sensing means communicating with said flow of fluid through said flowpipe;

signal means connected to said generating and sensing means and responsive to the differential pressure of said fluid flow in said flowpipe to generate signals indicative of said differential pressure;

means for receiving said signals and for determining the percentage of time during a given time interval that such signals are occurring; and,

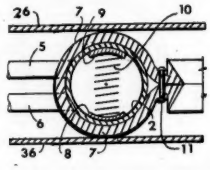
means for terminating the pumping operation in the event the determined percentage is less than a predetermined value, said terminating means being responsive to said receiving and determining means.

3,918,844

MEANS AND METHODS OF COMPRESSING ATMOSPHERIC AIR AND PRODUCING POWER AND VEHICULAR PROPELLANTS THEREFROM

Wayne Bailey, Box 89, Johnsonville, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,765
Int. Cl.² F04B *9/00*
U.S. Cl. 417—229 **1 Claim**



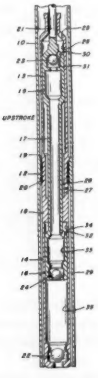
1. An apparatus positioned in a roadway to allow a vehicle moving over it to compress air by reason of the weight of said vehicle, said apparatus comprising: an expansible chamber or bellows composed of a rubber tire of fiberous reinforced rubber having an inner tube internally expanded by coiled springs, an inlet check valve for admitting air into said bellows and an outlet check valve for exhausting air from said bellows.

3,918,845

HIGH VOLUME HYDRAULIC RECOIL PUMP

Allen C. Heard, Monahans, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1973, Ser. No. 395,789
Int. Cl.² F04B *3/00*
U.S. Cl. 417—260 **4 Claims**



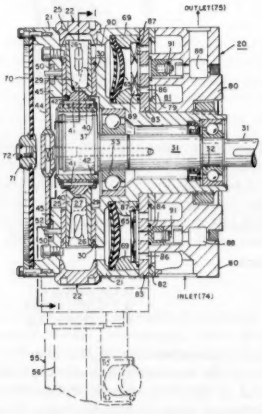
1. In a subsurface pump which includes:
upper and lower barrels;
upper and lower plungers movable up and down in the respective barrels and providing variable volume chambers both above and below each plunger in each barrel, the chamber below said upper plunger being annular;
connecting means rigidly joining said plungers;
said upper plunger having an upwardly facing area and a downwardly facing area, both of which areas are subject to fluid pressure, said upwardly facing area constituting the major portion of the cross-sectional area of the plunger;
said lower plunger having an upwardly facing area subject to fluid pressure;
means between said barrels closely receiving said connecting means;
a standing valve in said lower barrel, which standing valve opens during an upstroke of said plungers and closes during a downstroke thereof; and
upper and lower traveling valves in said upper and lower plungers respectively, both of which traveling valves open during an upstroke of said plunger, which lower traveling valve closes during a downstroke, and which upper traveling vlave closes during most of a downstroke;
the improvement comprising:
means acting during a downstroke of said plungers to subject the upwardly and downwardly facing areas of said upper plunger respectively to relatively high pressure of a column of fluid above the pump and to relatively low pressure of well fluid surrounding the pump to assure a net downward force acting on said upper plunger to provide hydraulic recoil;
means acting during an upstroke of said plungers to deliver fluid from the entire upwardly facing area of said upper plunger to provide a high volume of fluid delivery;
said upper traveling valve opening during a portion of a downstroke to deliver fluid;
whereby both hydraulic recoil and high volume are obtained in one pump.

3,918,846

VAPOR GENERATOR FEEDWATER PUMP

Max K. Winkler, Reno, Nev., assignor to Lear Motors Corporation, Reno, Nev.

Filed July 19, 1973, Ser. No. 380,717
Int. Cl.² F04B *9/08, 35/02*
U.S. Cl. 417—269 **16 Claims**



1. A fluid pump comprising:
a plurality of pistons arranged for sequential operation with uniform mechanical strokes;
a flexible diaphragm in the vicinity of each piston with fluid at the discharge face thereof and actuating oil between its opposite face and the piston;

a cylinder in close fit relation about each piston with a port that coacts with an opening slot in the piston wall;

an annular member displaceably mounted in the pump, said member being flat with equi-spaced peripheral slots, and a pin extending from each cylinder into one of the slots; and

means for angularly positioning said member to correspondingly control the range in the stroke of oil vented through the piston slot and its port to thereupon establish the effective stroke of the piston in displacing oil under pressure against its associated diaphragm.

3,918,847

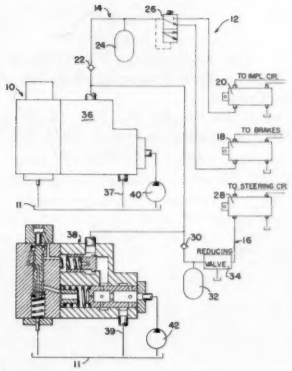
ACCUMULATOR CHARGING CIRCUIT FOR HIGH PRESSURE HYDRAULIC SYSTEM

John A. Junck, and Howard L. Johnson, both of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Feb. 6, 1974, Ser. No. 440,145

Int. Cl.[2] F04B *49/08*

U.S. Cl. 417—288 **2 Claims**



1. An accumulator charging system for charging accumulator means which supply fluid under pressure to a fluid user circuit, said system comprising; accumulator means, a source of fluid, first pump means in fluid communication with said source, first fluid communication means for communicating the output of said first pump means with said accumulator means, said first pump means having a fixed displacement and maximum pumping capacity of a first predetermined value, first automatic charging valve means in said first fluid communication means for controlling the flow of fluid from said first pump means to said accumulator means, said first automatic charging valve means being responsive to the pressure extant in said accumulator means for permitting fluid flow from said first pump means to said accumulator means only when the pressure within said accumulator means is within a first predetermined range of positive pressures and for returning fluid from said first pump means to said source when said accumulator means pressure is above said first predetermined range of pressures, second pump means in communication with said source, second fluid communication means for communicating the output of said second pump means with said accumulator means, second automatic charging valve means in said second fluid communication means for controlling the flow of fluid from said second pump means to said accumulator means, said second pump means having a fixed displacement and constant volumetric capacity of a given second predetermined value which is less than said first predetermined value, said second automatic charging valve means permitting fluid flow from said second pump means to said accumulator means when the pressure extant in said accumulator means is within a second predetermined range of positive pressures extending to a higher pressure than said first predetermined range of pressures, said second charging valve means being effective to return fluid from said second pump means to said source when accumulator pressure rises above the maximum pressure of said second predetermined range of pressures, said accumulator means including first and second fluid accumulator devices each said accumulator device being connected for fluid communication with both of said first and second automatic charging valve means at least partially through common conduit means, first check valve means in said first fluid communication means between said common conduit means and said first accumulator device for permitting flow from said first charging valve means to said first accumulator device but preventing reverse flow.

3,918,848

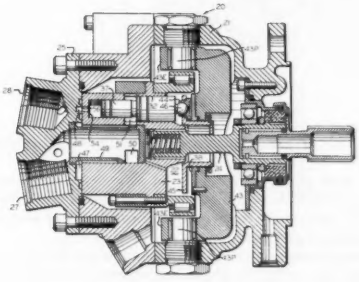
FLUID PRESSURE ENERGY TRANSLATING DEVICE

William J. Benson, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 247,950, April 22, 1972. This application Jan. 7, 1974, Ser. No. 431,071

Int. Cl. F04b *49/00*

U.S. Cl. 417—292 **1 Claim**



1. In a hydraulic pump or motor apparatus where a working member inside a cylinder barrel translates low pressure fluid at an inlet passage into high pressure fluid delivered at an outlet passage and wherein said passages are formed in spaced, generally parallel relation within a port cap separably attached to one end of the cylinder barrel, the fluid thus translated having a characteristic temperature condition at each passage for normal operation, a by-pass line within said port cap and connecting the passages to enable fluid to be circulated through the apparatus, said by-pass line including a bore located between said passages and extending transversely thereof, a reciprocal slide in the bore having a valving land normally presented in an obstructing attitude to an opening in the by-pass line, the slide having a passageway to be communicated to said opening to open the by-pass line, spring means located at one end of the bore and biasing said slide normally to said attitude to close the by-pass line, a thermal element located at the opposite end of said bore and bearing against said slide in opposition to said spring means, the thermal element expanding and contracting on a rise and fall in temperature, passage means inside the port cap communicating the fluid being pumped to said thermal element which expands to shift the slide to open the by-pass line at a predetermined abnormal fluid temperature, said by-pass line including first and second ports spaced from one another inside the port cap, said ports communicating respectively with the inlet passage and the outlet passage, said ports each communicating with said bore and one of said ports being normally closed by said valving land, wherein the thermal element is located within an enlarged chamber at one end of the bore, and wherein said passage means comprises two passages, one for

directing inlet fluid into said chamber and one for returning inlet fluid from said chamber to said inlet passage.

3,918,849

PISTON PUMP FOR VISCOUS MATERIALS

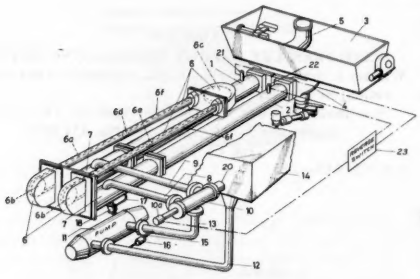
Rudi Schurenberg, Essen, Germany, assignor to Firma Torkret GmbH, Essen, Germany

Filed Apr. 8, 1974, Ser. No. 459,114

Claims priority, application Germany, Apr. 6, 1973, 7331303[U]

Int. Cl.² F04B *21/00*

U.S. Cl. 417—313 **7 Claims**



1. A piston pump for the displacement of a slurry, comprising:

at least one cylinder adapted to receive a hydraulically displaceable piston and provided at one end with means for selectively connecting this cylinder to a slurry outlet and a slurry inlet;

means forming at least one main passage for water constituting a hydraulic displacement medium connected to the other end of this cylinder and including a pump for displacing said hydraulic medium for shifting said piston and displacing said slurry in through said inlet and out through said outlet;

means forming a branch passage for said displacement medium over at least a portion of the length of said main passage and in parallel therewith; and

at least one electric heating element in said branch passage.

3,918,850

VIBRATION-ABSORBING SUPPORT FRAME FOR RAILWAY VEHICLE MOTOR-COMPRESSOR UNIT

Robert J. Bridigum, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 23, 1974, Ser. No. 535,735

Int. Cl.² F16F *15/00*

U.S. Cl. 417—363 **7 Claims**

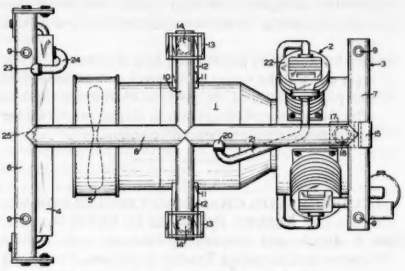
1. The combination of a motor-compressor unit for a railway vehicle and a support frame for mounting said motor-compressor unit to the underframe of the vehicle, said support frame comprising:

a. a pair of fixed parallel, spaced-apart end members for securing said support frame to the underframe of the vehicle;

b. a torque member extending from one of said end members to the other with its opposite ends rigidly secured to the end members, respectively, said torque member possessing limited, resilient, angular flexibility about its longitudinal axis; and

c. a suspension member rigidly secured at a point intermediate its opposite ends to said torque member intermediate the ends thereof and in transverse relation thereto,

d. said motor-compressor unit being resiliently supported by said opposite ends of said suspension member via which



vibrations of said motor-compressor unit are transmitted to said torque member and dissipated thereby.

3,918,851

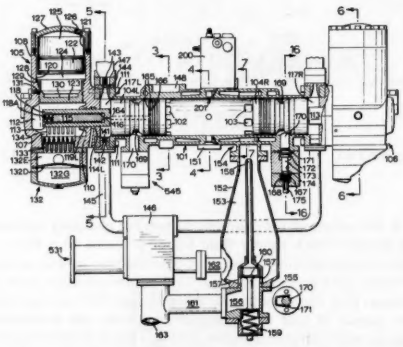
HIGH VELOCITY SHAFT SEAL

William Maurice Bard Fitzgerald, R.R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,722

Int. Cl.² F04B *17/00*

U.S. Cl. 417—364 **2 Claims**

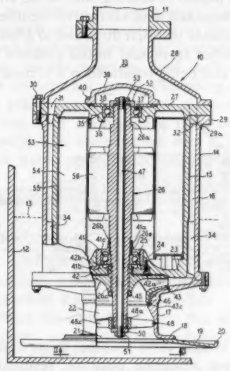


1. A power unit of the type comprising an internal combustion engine having a pair of opposed free pistons working in a common cylinder, a pair of pump units connected to the cylinder at opposite ends thereof, each pump unit comprising a pump piston coacting with a respective one of the engine pistons and working in a pump chamber, the engine cylinder providing inlet ports and exhaust ports communicating with respective inlet and exhaust manifolds for admitting combustion air to, and exhausting combustion gases from, the cylinder, the engine cylinder further providing first and second air compression spaces located respectively behind the engine pistons, each air compression space having a valve controlled air inlet and a valve controlled air outlet, and duct means connecting said air outlets with the inlet manifold wherein the air compression spaces are separated from the pump chambers by bulkheads providing cylindrical openings through which the pump pistons extend, each opening being formed with a drainage groove encircling the pump piston to provide a trap for leakage fluid, the grooves being connected by ducts to a float chamber having a float-controlled outlet, and means for biasing the float according to the average air pressure in said air compression spaces.

3,918,852
PUMP

James Coolidge Carter, 1735 San Pasqual St., Pasadena, Calif.

Filed June 24, 1974, Ser. No. 482,244
Int. Cl.² F04B 17/00
U.S. Cl. 417—424 10 Claims

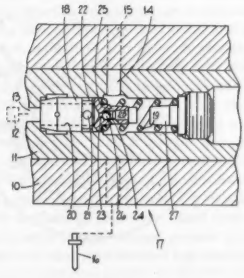


1. In a pump and motor unit having a main pump impeller and an inducer impeller ahead of the main pump impeller driven by the same motor from a hollow main drive shaft supported in axially spaced bearings in the unit, one of which is adjacent the main pump impeller and the other of which is remote from the main pump impeller, the improvement which comprises a second shaft extending through the hollow main shaft suspended from the remote bearing and supporting the inducer impeller to relieve the other bearing from thrust loads developed by the inducer impeller.

3,918,853
LIQUID FUEL PUMPING APPARATUS

Moshe Drori, 6 Cambridge Road, East Twickenham, Middlesex, England

Filed May 22, 1974, Ser. No. 472,435
Claims priority, application United Kingdom, May 25, 1973, 25245/73
Int. Cl.² F04B 29/00, 21/02, 39/10
U.S. Cl. 417—462 5 Claims

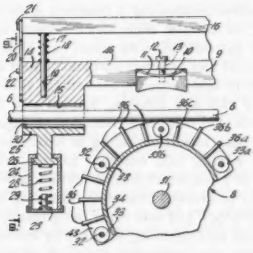


1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine comprising in combination, an injection pump, a body part, a distributor member rotatable in the body part, the injection pump and distributor member being adapted to be driven in time relationship with an associated engine, the distributor member including a passage communicating with the injection pump, the body part having outlet ports formed therein and said passage registering in turn during successive delivery strokes of the injection pump with the outlet ports formed in the body part and which in use, communicate respectively with the injection nozzles of an associated engine, a delivery valve in said passage and containing bore means open in one position to provide communication between said pump and passage and closed by portions of the distributor member in another position, said delivery valve opening during the delivery of fuel by the injection pump, said delivery valve comprising an axially movable valve element, resilient means biasing the valve element to a position in which flow of fuel from said passage to the injection pump is prevented, restricted passage means in said valve element and communicating between the bore means and the passage and a valve member in said passage means, said valve member closing to prevent flow of fuel through said passage means from said passage to the injection pump.

3,918,854
PERISTALTIC PUMP

Joseph Catarious, Harleysville, and Lawrence Clements, Philadelphia, both of Pa., assignors to Alphamedics Mfg. Corporation, Levittown, Pa.

Filed June 19, 1974, Ser. No. 480,972
Int. Cl.² F04B 43/08, 43/12, 45/06
U.S. Cl. 417—477 13 Claims



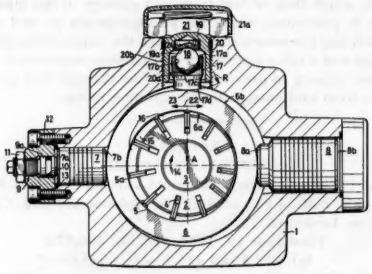
1. In a peristaltic pump for intermittantly occluding a compressible tube including:
a housing;
a rotary member mounted for rotation on said housing, said rotary member including a pair of spaced apart disc members and a transverse wall member;
a plurality of rollers carried by said rotary member for sequentially occluding said compressible tube, including a first roller for initially occluding said compressible tube, and a second roller for subsequently occluding said compressible tube, and;
a pumping shoe mounted on said housing adjacent said rotary member, whereby said compressible tube mounted on said housing between said rotary member and said pumping shoe is intermittantly occluded upon rotation of said rotary member, said pumping shoe projecting between said pair of spaced apart disc members, and being substantially narrower than the distance therebetween, the improvement which comprises;
a plurality of pairs of spaced radially projecting pins between each succeeding pair of rollers, said radially projecting pins mounted upon said transverse wall member, and including a first pair of radially projecting pins adjacent said second roller, the pins of said first pair being spaced a distance approximately equal to the diameter of said compressible tube, and wherein the pins of each succeeding pair of said radially projecting pins approaching said first roller being spaced a distance greater than that of said preceding pair of radially projecting pins.

6. The peristaltic pump of claim 3 including a pair of said reciprocating clamp means for firmly retaining portions of said compressible tube in either side of said rotary member.

3,918,855
ADJUSTABLE VANE PUMP

Siegfried Bornholdt, Lohr (Main), Germany, assignor to Rexroth GmbH, Lohr (Main), Germany

Filed Aug. 1, 1974, Ser. No. 493,969
Claims priority, application Germany, Nov. 16, 1973, 2357182
Int. Cl.[2] F01C *21/16;* **F03C** *3/00;* **F04C** *15/04;* **F04B** *49/00*
U.S. Cl. 418—24 **7 Claims**



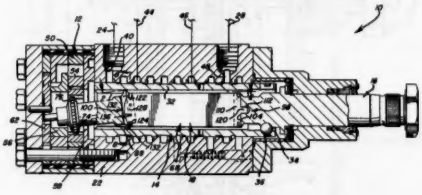
1. In a hydraulic machine, particularly in a vane pump, a combination comprising a housing; a rotor mounted in said housing; an annular slide block located in said housing and spacedly surrounding said rotor, said slide block having endless internal and external surfaces; liquid displacing elements mounted in said rotor for movement substantially radially of the rotor axis and abutting against said internal surface, at least while said rotor is driven; and an adjustment mechanism for said slide block, including at least one adjusting member abutting against said external surface and movable in said housing in a predetermined direction substantially radially of said rotor to thereby change the distance between the axes of said slide block and said rotor, an arresting member angularly offset from said adjusting member by less than 180°, as considered in the circumferential direction of said rotor, and having a contact surface abutting against said external surface, said contact surface being flat or convex, as considered in said predetermined direction, an adjustable abutment member located in said housing radially outwardly of said arresting member, and a spherical insert interposed between said abutment member and said arresting member, said abutment member having a concave surface which is engaged by said spherical insert and having a radius of curvature greater than the radius of said insert, the distance from the locus of contact between said abutment member and said insert to the locus of contact between said contact surface and said external surface being less than the radius of curvature of said contact surface.

3,918,856
GEROTOR FLUID CONTROLLER WITH TWISTABLE BLADE ENERGY STORING MEANS

Laurence L. Miller, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,463
Int. Cl.[2] F01C *1/02;* **F03C** *3/00;* **F04C** *1/02;* **F16D** *3/52*
U.S. Cl. 418—61 B **10 Claims**

1. An apparatus for use in controlling a flow of fluid, said apparatus comprising a housing having first and second outlet ports, gerotor gear means connected with said housing and operable in one direction to provide a metered flow of fluid to said first outlet port and operable in another direction to provide a metered flow of fluid to said second outlet port, commutator valve means associated with said gerotor gear means for directing fluid to and from said gerotor gear means, directional control valve means for porting fluid to said commutator valve means and for porting fluid received from said commutator valve means to one of said outlets, said directional control valve means including a valve member movable in a first direction from an initial position to a first actuated position to port a flow of fluid to said commutator valve means and to port fluid from said commutator valve means to said first outlet and movable in a second direction from the initial position to a second actuated position to port a flow of fluid to said commutator valve means and to port fluit from said commutator valve means to said second outlet, an input member operatively connected with said valve member, said input member being rotatable in a first direction to effect movement of said valve member from said initial position to said first actuated position and being rotatable in a second direction to

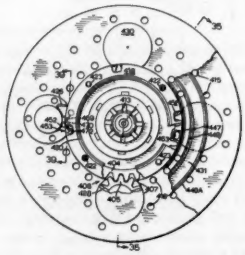


effect movement of said valve member from said initial position to said second actuating position, resiliently twistable blade means operatively connected with said input member and said directional central valve means for storing energy to effect movement of said valve member from said actuated positions back to said initial position, means for enabling twisting of said blade means about the central axis thereof upon rotation of said input member to store energy to effect subsequent movement of said valve member from one of said actuated positions to said initial position, and said blade means being located in a fluid flow path between said commutator valve means and said directional control valve means.

3,918,857
HYDRAULIC MOTORS WITH INTERMESHING SUN AND PLANET GEARS

William Maurice Bard Fitzgerald, R. R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,724
Int. Cl.[2] F01C *1/08;* **F03C** *3/00;* **F04C** *1/14;* **F01C** *19/08*
U.S. Cl. 418—73 **8 Claims**



1. A hydraulic motor comprising a stator, a geared rotor assembly cooperating with the stator, and inlet and outlet connections to the stator for supplying working fluid for driving the motor, the stator providing a main internal cavity defining a main rotational axis, and a plurality of crescentic lobe-shaped cavities adjoining the main cavity and equally spaced therearound, the geared rotor assembly comprising a sun gear journalled in the main cavity for rotation about said axis and a set of planet gears substantially filling the lobe-

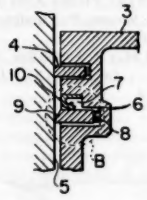
shaped cavities and meshing with the sun gear, the stator further providing an inlet manifold, an outlet manifold, and ducts connecting the inlet and outlet manifolds with the lobe-shaped cavities for supplying hydraulic fluid therethrough whereby to drive the intermeshing gears, each planet gear being rotatably journalled in bearings, the bearings of each planet gear being formed with a pair of open slots to which pressurized fluid is supplied selectively in accordance with the direction of motor drive, the slots being positioned relative to the rotational axis of the planet gear so that the force exerted by pressurized fluid supplied thereto tends to reduce out-of-balance loads on the bearings, and each planet gear being formed with an internal cavity extending axially between a pair of end plates, each end plate containing a small hole communicating with a respective inlet or outlet manifold, each said small hole cooperating with a pressure-operated, spring-loaded valve plate, each valve plate having a bleed opening.

3,918,858

OIL SEAL ARRANGEMENT FOR A ROTARY ENGINE

Kenichi Imaizumi, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 31, 1974, Ser. No. 475,188
Claims priority, application Japan, June 2, 1973, 48-64498; Apr. 19, 1974, 49-43637
Int. Cl.² F01C *19/00*; F04C *27/00*; F16J *15/16*
U.S. Cl. 418—142 **15 Claims**



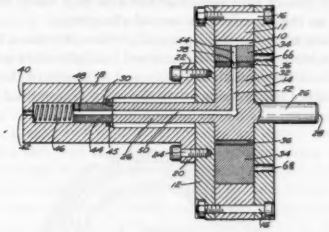
1. An oil seal arrangement for a rotary engine comprising a rotor having side surfaces facing the side surfaces of a housing member, a first annular groove formed in the side surfaces of said rotor encircling the axis of said rotor, a second annular groove formed in the side surfaces of said rotor and encircling the axis of said rotor, said first and second annular grooves being contiguous and opening laterally one into the other, a seal ring positioned in said first annular groove and arranged to project outwardly therefrom for contact with the side surfaces of the housing member, an oil seal having a U-shaped cross sectional configuration fitted into said second annular groove and disposed in spaced relationship to the side surface of said housing member, said U-shaped oil seal having a first leg and a second leg extending in the direction of said annular groove into the side surface of said rotor, said first leg being supported against the wall of said second groove spaced from said first annular groove and said second leg extending from said second groove into said first groove in the direction transversely of the depth of said second groove into said rotor and being biased against said oil seal ring so that the oiltightness between said first annular groove and said seal ring can be maintained, the surface of said second leg facing toward said oil seal being approximately convex in section with the portion of the convexly shaped surface contacting said oil seal being located intermediate the inner and outer ends of said second leg with the remaining portions of the surface facing toward said oil seal being spaced therefrom.

3,918,859

VALVELESS ROTARY PISTON EXPANSION ENGINE

Martin F. Dugan, Portsmouth, and Daniel A. Bowlus, Middleton, both of R.I., assignors to The United States of America as represeted by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1974, Ser. No. 439,802
Int. Cl.² F01C *21/00, 1/42*
U.S. Cl. 418—187 **6 Claims**



1. A valveless rotary piston engine of the external combustion and open cycle type having a rotor with multiple flanks and side seals and mounted on a shaft-eccentric for rotational motion within a housing enclosed by a first end-plate and a second end-plate and defining a working chamber of variable volume during the rotation of said rotor by introduction of a gaseous working fluid at relatively high pressure and temperature in said working chamber, an improved means for controlling the introduction of said working fluid in said working chamber from an external source thereof which comprises:

a first passage through said shaft eccentric for receiving said working fluid from said external source;

a second passage through said rotor and a bushing attached to said rotor, said bushing having a first plurality of slots and said bushing serving as a rotor-shaft eccentric bearing, said second passage being in and out of alignment with first passage during the rotation of said rotor;

a second plurality of slots in said rotor, each of said multiple flanks of said rotor having at least one slot of said second plurality of slots, each slot of said first plurality of slots in said bushing being aligned with a corresponding slot of said second plurality of slots in said rotor; and

a pair of exhaust ports in said second end-plate, each one of said pair of exhaust ports being covered and uncovered in succession during the rotation of said rotor.

3,918,860

ROTARY ENGINE

Sandor J. Zarnoti, 8510 Bruce, Niles, Ill. 60648

Continuation of Ser. No. 291,053, Sept. 21, 1972, abandoned. This application June 12, 1974, Ser. No. 478,593
Int. Cl.² F02B *53/00*
U.S. Cl. 418—191 **33 Claims**

1. An improved balanced, rotary engine having a cycle which includes the four phases of intake, compression, expansion and exhaust, the engine comprising:

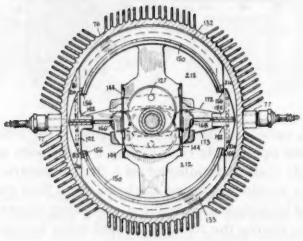
housing means including at least one outer body, a cylinder wall in the housing body defining a generally cylindrical chamber in the outer body, and plate members which are adapted to close the ends of said cylindrical chamber;

said cylindrical chamber having a central, longitudinal axis and being comprised of at least two inter-communicating, coplanar, substantially, identical sub-chambers, said sub-chambers each having a center axis which is parallel to said longitudinal axis and having, in a plane perpendicular to said longitudinal axis, a sector-shaped cross-section, with said sector radii of said sub-chambers being of equal length, and with said center axes of said sub-chambers being equi-spaced from each other about said longitudinal axis and being equally eccentrically spaced from said

longitudinal axis a distance less than the length of said sector radii;

rotor means including at least two, substantially, identical rotors positioned in said chamber and adapted to rotate in said chamber in a plane perpendicular to said longitudinal axis, with the number of rotors in said chamber being equal to the number of said sub-chambers, and with a rotor being mounted in each of said sub-chambers so that the rotor may rotate in said chamber about the said center axis of said sub-chamber and may move with respect to the other rotors in said chambers;

each of the rotors including a wall portion that has a leading end, a trailing end, and a curved, radially outwardly directed surface which is positioned adjacent to the cylinder wall of the housing when the rotor is mounted in said



chamber, with the radius of curvature of said curved surface being substantially equal to said sector radii, and the center of curvature of said curved surface coinciding with said center axis in said sub-chamber in which the rotor is mounted whereby a variable volume working chamber is defined between said curved surfaces of the rotors and the cylinder wall of the housing during rotation of the rotors in said chamber;

means for selectively permitting ingress and egress a working fluid into and out of said working chamber; and

means for preventing working fluid in said working chamber from passing radially inwardly from said working chamber, between the wall portions of adjacent pairs of rotors, to the interior of said chamber during rotation of the rotors in said chamber.

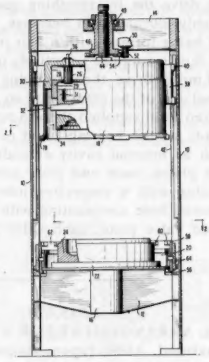
3,918,861

VULCANIZING PRESS WITH ROTARY LOCKING MECHANISM

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Oct. 11, 1974, Ser. No. 513,949
Int. Cl.² B29H *5/02*
U.S. Cl. 425—47 **16 Claims**

1. In a clamping and locking mechanism for securing cooperating elements to one another including a fixed lower element and a movable upper element, a ring member secured to said fixed lower element, a locking ring co-axial with said ring member and arranged in superimposed spaced relation thereto, a pull down ring engaging said locking ring and said ring member, said locking ring having a plurality of circumferentially spaced lugs arranged to define a slot between adjacent lugs, a ring flange provided on said upper element and including a plurality of circumferentially spaced lugs arranged to define a slot between adjacent lugs, means for moving said upper element towards said lower element with the slots in said locking ring permitting said ring flange lugs to pass therethrough with the lower end of said upper element engaging said lower element, means engaging said locking ring and rotating same with respect to said flange to move the lugs on said locking ring to wherein they overlie in vertically spaced relation the lugs of said flange and means for rotating said pull down ring about said ring member to move said locking ring towards said ring member while moving the lugs on said lock-



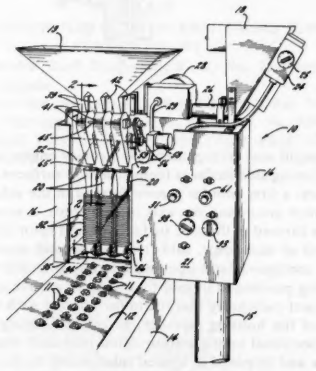
ing ring into engagement with the lugs of said ring flange to secure said upper element to said lower element.

3,918,862

APPARATUS FOR FORMING NUT CLUSTER CONFECTIONS AND THE LIKE

Lawrence Bellew, Secane, Pa., assignor to Garner A. Beckett, Lafayette, Calif.

Filed May 3, 1973, Ser. No. 357,013
Int. Cl.² A23G *1/30*
U.S. Cl. 425—114 **17 Claims**



1. An apparatus for continuously making confections of the type having solids held in an irregular free formed cluster by a fluid binder which sets upon cooling comprising a unitary mixing and extrusion chamber, means for continuously feeding a supply of said solids into said chamber, means for continuously feeding a separate stream of said fluid binder into said chamber, means for mixing said solids and binder in said chamber while simultaneously moving said mixture through said chamber and extruding it out an outlet thereof, cutting means immediately adjacent said outlet for successively severing the extruded mixture of solids and binder into predetermined sized clusters as said mixture is extruded from said outlet, and a movable conveyor belt disposed in spaced relation below said chamber outlet and cutting means for succes-

sively and directly receiving said clusters as they are severed at said chamber and for transporting said clusters away from said chamber.

3,918,863

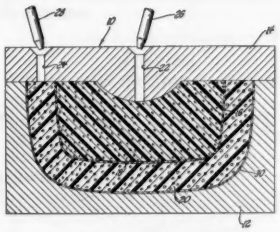
ONE STEP DUAL FOAM CRASH PAD MOLD ASSEMBLY

Richard D. Rhodes, Jr., Somersworth, N.H., assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 244,502, April 17, 1972, Pat. No. 3,840,627. This application Apr. 17, 1974, Ser. No. 461,742

Int. Cl.² B29C *1/00*

U.S. Cl. 425—117 **7 Claims**



1. A mold assembly of the type used to manufacture multi-density foamed articles comprising; a body member and a cover member defining a mold cavity, said members being movable between open and closed positions for opening and closing said cavity, a nondistortable sheet disposed within said mold cavity for dividing said mold cavity into at least two sections, said sheet being removably attached to one of said members for being removed from said mold cavity with a foamed article, said sheet being suspended from its extremities and extending centrally through said cavity in spaced relationship to said members whereby said sheet is suspended within said cavity, and passage means in communication with each of said sections whereby foamable materials may be injected substantially simultaneously into each of said sections while maintained separated.

3,918,864

MOLDING OF SYNTHETIC PLASTIC MEMBERS ONTO A TRAVELLING ELONGATED ELEMENT

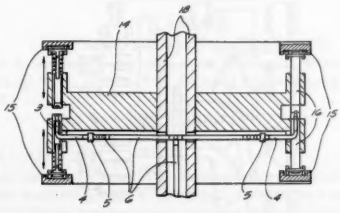
Dieter Braun, Koln, Germany, assignor to Felten & Guilleaume Kabelwerke Aktiengesellschaft, Koln-Mulheim, Germany

Division of Ser. No. 334,952, Feb. 22, 1973. This application Apr. 9, 1974, Ser. No. 459,354

Claims priority, application Germany, Feb. 23, 1972, 2208545

Int. Cl.² B29F *1/10*

U.S. Cl. 425—129 R **6 Claims**



1. Apparatus for molding synthetic plastic members onto a travelling elongated element, comprising mold means including a train of individual molds each having two mold sections; means mounting said molds for travel in a circular path so that said mold sections of each mold travel concurrently along a common plane at opposite sides thereof; means for displacing said mold sections relative to one another substantially normal to said common plane between retracted positions in which said mold sections are disengaged from, and extended positions in which said mold sections engage, the elongated element and define a molding cavity about a portion of the same, said displacing means including rail means situated along said circular path spaced from said common plane and having surfaces at varying distances from the latter, and follower means connected with the respective mold sections and operative for following said surfaces and for displacing said mold sections in dependence on the instantaneous distance of said surfaces from said common plane, said displacing means comprising a first and a second guide tube for the respective mold sections, said rail means comprising an upper and a lower pressure rail, and said follower means comprising a first and a second ram each for one of said mold sections, a first and a second pressure spring each acting upon one of said rams and guide tubes, and two pairs of rollers each engaging one of said rams and one of said pressure rails; and means for introducing hardenable synthetic plastic material into the respective molding cavity to harden therein and to form the member about said portion of the elongated element when said mold sections of a given mold define said molding cavity, and including a source of said material located centrally of said circular path, a plurality of conduits each communicating said source with one of said molding cavities, and means for controlling the passage of said material through the respective conduits and including valve means in each of said conduits.

3,918,865

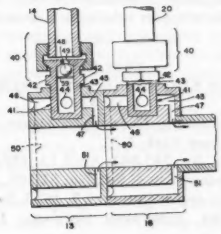
COEXTRUSION SYSTEM

Frank R. Nissel, Ambler, Pa., assignor to Welex Incorporated, King of Prussia, Pa.

Filed Sept. 28, 1973, Ser. No. 401,669

Int. Cl.² B29D *3/12*

U.S. Cl. 425—131.1 **14 Claims**

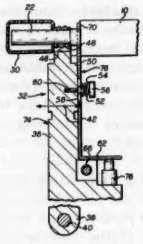


1. A coextrusion system for producing a multi-laminar plastic sheet, comprising: primary means continuously advancing a flowable plastic material, an adaptor arranged to conduct said material to flow in a predetermined path of advancement, supply means connected to said adaptor to supply continuously a flowing laminar body of supplementary flowable plastic material in said adaptor to said material, means forming a plurality of passages connected to said adaptor arranged respectively to supply said supplementary flowable plastic material to a limited portion of the area of said material at spaced locations around the transverse perimeter of said path, flow interrupting means connected to said adaptor movable selectively to divert said supplementary flowable plastic material to flow in one or more preselected passages, and a sheet die converting the shape of said flowing laminar material to substantially sheet form.

3,918,866
APPARATUS FOR DETECTING DEPOSITS ON CORE RODS

Walter Eichenberger, Ocean City; David Mulraney, Hackettstown, and Melton E. Reese, Plainfield, all of N.J., assignors to Rainville Company, Inc., Middlesex, N.J.

Filed May 7, 1974, Ser. No. 467,635
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—136 **10 Claims**

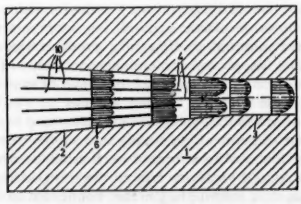


1. In a molding machine, a table having a plurality of faces in angular relation to one another, core rods extending from said faces, operational stations including a plastic supply station at which core rods are coated with a parison, a blow molding station, and a stripper station, means for moving the table to shift the core rods to successive stations, a primary stripper at the stripper station with surfaces that contact with blown articles made from said parisons, and a secondary stripper behind the primary stripper and with surfaces that follow the primary stripper, the primary and secondary strippers having means to allow for relative movement toward and from one another in the direction of extent of the core rod when there is an obstruction on the core rod at the stripper station, means for moving the primary and secondary strippers simultaneously lengthwise of the core rod, said surfaces that follow the primary stripper being positioned to contact with any obstruction formed by a residual portion of a parison that is not removed from the core rods by the operation of the primary stripper, and an obstruction detector operated by said movement of the strippers relative to one another.

3,918,867
DEVICE FOR EXTRUDING PERMANENT MAGNET BODIES

Lutz Beyer, Pinneberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 243,842, April 13, 1972, abandoned, which is a continuation of Ser. No. 51,505, July 1, 1970, abandoned. This application May 7, 1973, Ser. No. 357,894
Claims priority, application Germany, June 28, 1969, 1932970
Int. Cl.[2] B29B *3/04*
U.S. Cl. 425—174 **3 Claims**

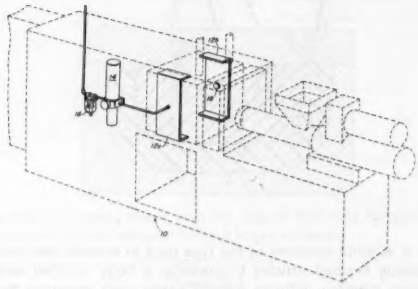


1. A device for extruding permanent magnetic bodies consisting of magnetic particles mixed with a binder comprising a nozzle having a tubular member and a plurality of thin juxtaposed partitions each provided with a knife-edge extending longitudinally within said tubular member in the direction of extrusion, the length of each of the partitions decreasing radially from the center of the tubular member towards the wall, and means surrounding said tubular member for producing an orienting magnetic field within said tubular member.

3,918,868
APPARATUS FOR PURGING EJECTING PIN CAVITIES

Henry F. Villaume, Intervale, N.H., assignor to Howell Laboratories, Incorporated, Bridgton, Maine

Filed June 20, 1974, Ser. No. 481,036
Int. Cl.[2] B29F *1/00*
U.S. Cl. 425—169 **3 Claims**



1. In an injection molding machine wherein the ejecting pins are disposed in an ejecting pin actuation cavity which is defined by portions of the machine and is exposed to the atmosphere, the improvement which comprises:

means to seal an ejecting pin actuation cavity from the atmosphere;

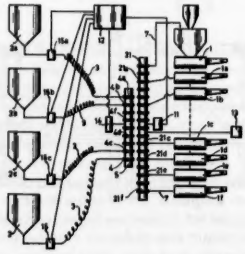
means to provide a dried air stream; and

means to introduce the dried air stream into the ejecting pin actuation cavidy at a positive pressure to prevent the condensation of moisture on the surfaces of the ejecting pins.

3,918,869
APPARATUS FOR AUTOMATICALLY FEEDING A NUMBER OF EXTRUDERS FROM A NUMBER OF SUPPLY CONTAINERS

Frederik van der Ploeg, Dalfsen, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Feb. 19, 1974, Ser. No. 443,848
Claims priority, application Netherlands, Feb. 20, 1973, 73/02359
Int. Cl.[2] B29F *3/02*
U.S. Cl. 425—190 **8 Claims**



1. Apparatus for selectively feeding plastic material from a plurality of supply containers to a plurality of extruders, said

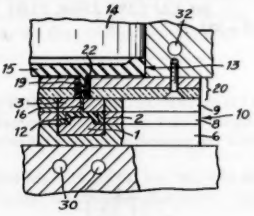
apparatus comprising a plurality of discharge nozzles, means connecting said discharge nozzles to the supply containers so that each container can supply a respective discharge nozzle with plastic material, a plurality of extruder supply nozzles, means connecting said supply nozzles to the extruders so that each extruder can be supplied with plastic material from a respective supply nozzle, a first plate supporting said supply nozzles as a first assembly, a second plate parallel to the first plate and supporting said discharge nozzles as a second assembly, valve means for controlling the flow of material between each supply container and its associated discharge nozzle, means for moving said plates relative to one another to selectively engage one discharge nozzle with an associated supply nozzle, and means for operating said valve means to allow the material to flow to said one discharge nozzle from the associated supply container.

3,918,870

INJECTION MOLDING MACHINE

Roger W. Tetzlaff, Orrville, Ohio, assignor to Norton Company, Worcester, Mass.

Filed Feb. 13, 1974, Ser. No. 441,945
Int. Cl.² B29G *3/00*; B29H *3/12*
U.S. Cl. 425—251 **1 Claim**



1. In an injection molding system wherein an uncured elastomer is injected into a mold chamber from a supply chamber having a piston, the mold chamber is heated to cure the injected elastomer and the supply chamber is insulated from the mold chamber by an insulating plate having TFE-lined feeding holes through the insulating plate, the improvement comprising means for causing removal of uncured flash material by said piston wherein the insulating plate is a composite plate having a metallic backing member adjacent the elastomer supply and an insulating layer adjacent the mold surface, the upper surface of the metallic backing member having a TFE coating, each TFE lined feeding hole having an outwardly facing conical feeding passage and an inwardly facing conical feeding passage, the apexes of the two conical passages being joined by a narrow cylindrical passage and being aligned with a sprue, the narrowest portion of each feeding passage being arranged at the position where the curing process normally stops.

3,918,871

ARTICLE TRIMMING APPARATUS

Elmer L. Anderson, Corning, and Thomas F. Hillman, Bath, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,137
Int. Cl.² B29C *3/00, 17/00*
U.S. Cl. 425—292 **4 Claims**

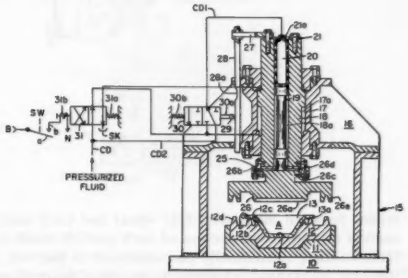
1. Apparatus for trimming thermoplastic material surrounding the bordering edge of an article formed in a die from a sheet of pliable thermoplastic material arranged over said die, such die having a trimming edge and such apparatus comprising, in combination;

I. a pressurized fluid cylinder embodying a first piston extending through the ends of such cylinder, such piston having a longitudinal bore extending therethrough concentric with the bore of said cylinder and such cylinder and piston being disposed above said die with the axial centerlines of the bores of the cylinder and piston generally in vertical axial alignment with the center of such die normal thereto;

II. a second piston fitting snugly slidable in said bore of said first piston with the lower end of such second piston extending out of the lower end of the bore of the first piston and such second piston being shorter than the length of the bore of the first piston;

III. a trimmer having a lower cutting edge cooperative with said trimming edge of said die for trimming said thermoplastic material and a flange on the upper end of such trimmer, such flange having a flat lower surface;

IV. a support member attached to the lower end of said first piston, such member extending downwardly and partly under said lower surface of said flange on said trimmer for supporting such trimmer for movement in a plane paralleling said trimming edge of said die and with the upper surface of said flange adjacent the lower end of said second piston;



V. a pressure accumulator bag of a resilient material disposed and fitting in the upper end of said bore in said first piston with its lower end adjacent the upper end of said second piston;

VI. means for alternately supplying pressurized fluid to the upper and lower ends of said cylinder for downward and upward actuations of said first piston respectively, such downward actuation of such piston moving said trimming and cutting edges into cooperative relationship with each other for trimming said thermoplastic material surrounding said bordering edge of said article; and

VII. means for controlling a supply of pressurized fluid to said accumulator bag to actuate said second piston downwardly and the lower end of such piston into firm contact with said upper surface of said flange on said trimmer for locking thereof against said movement in said plane at times other than when said cutting edge is closely approaching and thereafter reaches said cooperative relationship with said trimming edge for trimming said thermoplastic material.

3,918,872

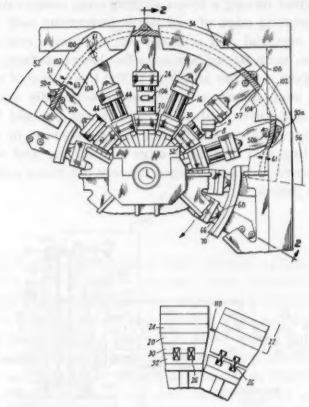
APPARATUS IMPROVEMENTS IN A ROTARY BLOW MOLDING MACHINE

James C. Logomasini, Bridgeton, Mo., and Richard K. Shelby, Hinsdale, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 182,074, Sept. 20, 1971, Pat. No. 3,785,761. This application Oct. 25, 1973, Ser. No. 409,652
Int. Cl.² B29D *23/03*
U.S. Cl. 425—308. **4 Claims**

1. A rotary blow molding machine comprising a wheel having a plurality of arms, each arm carrying a partible mold which includes an inner and an outer mold section, said outer

mold section being radially movable along said arm for closing said mold on a portion of a continuous tubular parison fed to said machine and for opening said mold to release an article formed therein, first cam means including a cam having an outwardly increasing mold-opening portion and a mold-closing portion and including followers carried with each outer mold section for periodic rolling engagement with said cam, second cam means for holding said mold sections closed during a portion of a rotary path of travel thereof, and spring



means between the axis of said wheel and each inner mold section to permit one section of each partible mold to move incrementally substantially perpendicular to the axis of said wheel as said followers traverse segments of the mold-opening and mold-closing portions of said cam, whereby plastic is severed between an opening mold and a next adjacent still-closed mold because of outward differential movement of the inner mold section of the opening mold with respect to said next adjacent mold still held closed by the second cam means.

3,918,873

TABLETTING MACHINES

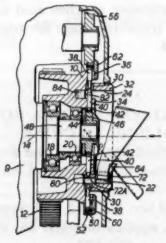
Jack Crossley, and David Henry Wilson, both of Liverpool, England, assignors to Manesty Machines, Ltd., Liverpool, England

Filed Nov. 12, 1974, Ser. No. 523,143

Claims priority, application United Kingdom, Nov. 17, 1973, 53494/73

Int. Cl.² B30B *11/08*

U.S. Cl. 425—345 **19 Claims**



1. In a tabletting machine in which the powdered or granulated material to be tabletted is fed from a feed frame onto the surface of a rotating die table so as to fill dies in the die table and be compressed into a tablet in each die, between a pair of punches individual to the die, and which enter the die from opposite ends, one of the punches being subsequently withdrawn from the die and the other punch being pushed through the die to eject the tablet from the die, the improvement wherein:

a. the punches are arranged for movement relative to the die table, radially with respect to the axis of the die table,

b. a flexible hoop is provided which rotates with the die table and which is constrained and guided by abutments so as to assume a non-circular shape, and

c. means is provided for moving corresponding ones of each pair of punches under the control of radial deflections of said flexible hoop,

one at least of said abutments being adjustable radially with respect to the axis of rotation of the die table thereby to adjust the movement of said corresponding ones of said punches.

3,918,874

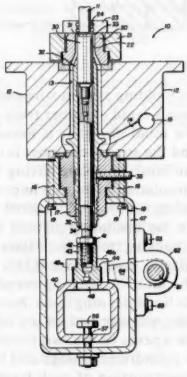
APPARATUS FOR MULTI-ORIFICE EXTRUSION

Ambrose B. Dybala, Toledo; David Jesiolowski, Maumee; Casimir W. Nowicki, Toledo, and Thomas A. Shapler, Bowling Green, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 4, 1974, Ser. No. 447,537

Int. Cl.² B29D *23/04*, *23/03*

U.S. Cl. 425—381 **20 Claims**



1. An extrusion apparatus comprising a plurality of annular extrusion orifices aligned in a single plane and receiving plasticized material from a melt system, each orifice being defined by relatively axially displaceable mandrel and bushing elements, means for simultaneously and identically varying the dimension of each orifice by axially displacing said orifice-defining elements, said means including a laterally movable beam elongated in said single plane and outside said melt system, said beam supporting the displaceable element of each orifice, and actuating means for laterally moving the beam axially of said orifice, the entire beam being restrained for equidistant planar lateral movement by said displaceable orifice-defining elements.

3,918,875
RECORD MAKING PRESS

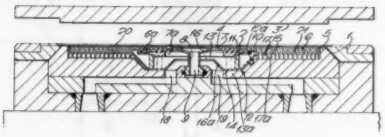
Alan Phillipson; Basil Harry Royston Spiller; Cyril Leslie Newman, and Robin Smith, all of London, England, assignors to Decca Limited, London, England

Filed Nov. 12, 1974, Ser. No. 523,114

Claims priority, application United Kingdom, Nov. 22, 1973, 54212/73

Int. Cl.² B29C *17/00*; **B25D** *17/00*

U.S. Cl. 425—384 **5 Claims**



1. A record-making press comprising a narrow hydraulic pressure chamber of which one broad wall is constituted by a flexible thermally conductive diaphragm capable of impressing contours of a matrix onto a sheet of thermoplastic material, a hydraulic fluid inlet and hydraulic fluid outlet for the chamber, and a thermally conductive structure which extends throughout a substantial part of the chamber for inducing turbulence into the flow of fluid therethrough.

3,918,876
APPARATUS FOR BLOW-MOULDING HOLLOW BODIES

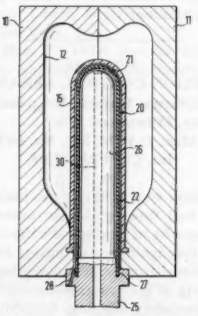
Peter Rose, Henstedt-Ulzburg, Germany, assignor to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Germany

Filed Mar. 25, 1974, Ser. No. 454,664

Claims priority, application Germany, Apr. 3, 1973, 2316593

Int. Cl.² B29D *23/03*

U.S. Cl. 425—389 **1 Claim**



1. Apparatus for blow-moulding preheated parisons of thermoplastic material comprising, in combination, a mold defining an elongated cavity having a closed end and a mandrel receiving end, an elongated mandrel extending into said mold cavity through said mandrel receiving end, said mandrel having an inner end disposed adjacent the cavity closed end, an outer end adjacent said cavity mandrel receiving end and an exterior surface, a passage longitudinally extending through said mandrel intersecting said inner end, an elongated elastic tubular rubber bellows encompassing said mandrel within said mold cavity having an inner closed end adjacent said mandrel inner end and a sealed end sealed to said mandrel outer end, said bellows having a variable radial wall thickness increasing in thickness from said sealed end toward said bellows' inner closed end whereby inflation of said bellows by a pressurized medium entering said passage causes said bellows to initially longitudinally extend toward said cavity closed end prior to significant radial bellows expansion occurring, means for mounting an elongated heated parison of thermoplastic material within said mold cavity encompassing said bellows whereby inflation of said bellows initially elongates said parison prior to significant radial expansion thereof within said cavity, and a vent passage defined in said mandrel and positioned so as to be communicable with the interior of a parison placed thereon and with the atmosphere to vent the interior of said parison during expansion thereof by said bellows.

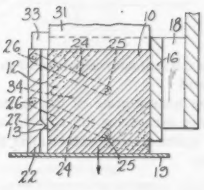
3,918,877
CONCRETE BLOCK MOLD WITH PARALLEL LINKAGE MEANS

William H. Pickett, Framingham, Mass., assignor to Plasticrete Corporation, Hamden, Conn.

Filed Dec. 26, 1973, Ser. No. 427,829

Int. Cl.² B28B *13/05*

U.S. Cl. 425—443 **1 Claim**



1. A mold for casting concrete blocks comprising, two oppositely disposed fixed end walls, a fixed rear wall, a bottom floor, means for moving vertically said floor, a movable front wall engageable with edges of said fixed end walls, the inner surface of the movable wall being non-planar and constituting means for embossing indicia on the face of a block in the mold, rigid links in a parallel relationship pivotally connected to the ends of said movable wall and to each of said two fixed end walls, said links being disposed at an acute angle to the horizontal when the movable wall is engaged with said edges, the bottom edge of said movable wall resting on said bottom floor when the mold is closed, and said movable wall being movable away from the edges of the fixed walls, under control of said links, when said floor and movable wall are moved downward, said fixed walls having their bottom edges in a common plane, the bottom edge of said movable wall also lying in said common plane, and means for ejecting a block from the mold, said latter means being normally above the mold and having a part projecting over the upper edge of the front wall in a position to engage and move downward the movable front wall in synchronism with downward movement of the floor.

3,918,878
APPARATUS AND METHOD OF IGNITION FOR COMBUSTIBLE GASES

Warren A. Rice, Dexter, Mich., assignor to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Aug. 17, 1973, Ser. No. 389,251

Int. Cl.² F23N *5/20*, *5/22*

U.S. Cl. 431—6 **11 Claims**

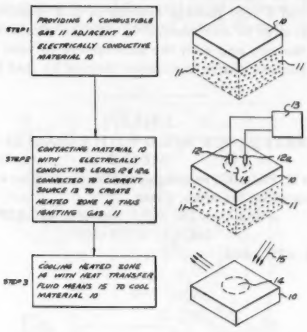
1. The method of igniting a combustible gas to produce a rapid thermal energy release and pressure rise which comprises:

a. providing an ignitable gas adjacent to and on one side of an electrically conductive igniter material having sufficient mechanical strength when heated to withstand a rapid thermal energy release and pressure rise in the gas

adjacent to the igniter material and having sufficient surface on the side opposite the gas to permit cooling;

b. heating the igniter material by passing an electric current through the material such that a zone between spaced apart electrically conductive low resistance leads connected to a current source is heated to ignite the combustible gas; and

c. cooling the heated zone of the igniter material using a heat transfer means on the surface opposite the gas to below the ignition temperature after the combustible gas has ignited.


STEP 1
PROVIDING A COMBUSTIBLE GAS 11 ADJACENT AN ELECTRICALLY CONDUCTIVE MATERIAL 10
STEP 2
CONTACTING MATERIAL 10 WITH ELECTRICALLY CONDUCTIVE LEADS 12 & 12a CONNECTED TO CURRENT SOURCE 13 TO CREATE HEATED ZONE 14 FOR IGNITING GAS 11
STEP 3
COOLING HEATED ZONE 14 WITH HEAT TRANSFER FLUID MEANS 15 TO COOL MATERIAL 10

3,918,879

METHOD AND APPARATUS FOR DETONATING COMBUSTIBLE SUBSTANCES AT ATMOSPHERIC PRESSURE

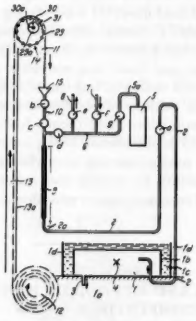
Karl Ewald Arvidsson, Dannemoragatan 10, 11344 Stockholm, Sweden

Filed July 26, 1974, Ser. No. 492,594

Claims priority, application Sweden, Aug. 3, 1973, 73106809

Int. Cl.² F23K *5/00*

U.S. Cl. 431—8 **11 Claims**



1. A method for exploding or detonating a combustible gaseous substance at atmosphere pressure comprising

a. charging to an combustion chamber combustion ingredients consisting of

a1. a combustible gaseous substance,

a2. oxygen, preferably in the form of air,

a3. particles of an explosion substance,

b. obtaining a mixture of said ingredients in said chamber, and

c. igniting said mixture to explode or detonate the same.

3,918,880

SAFETY DEVICE FOR GAS-CONSUMING EQUIPMENT

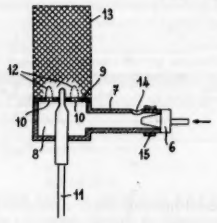
Roger Paul Pierre Risse, Caluire-et-Cuire (Rhone), France, assignor to Societe Lyonnaise des Applications Catalytiques, Rhone, France

Filed Dec. 27, 1973, Ser. No. 428,628

Claims priority, application France, Apr. 16, 1973, 73.14492

Int. Cl.² F23N *5/24*; **G01N** *31/00*

U.S. Cl. 431—22 **6 Claims**



1. In a safety device for gas-consuming equipment comprising a pilot-burner with a metastable flame which moves by displacing itself from its burner when the oxygen percentage of the ambient air drops below a predetermined limit, and a thermosensitive detector means for shutting off or greatly reducing the gas supply to said gas-consuming equipment upon sensing displacement of the burner flame of the said pilot burner, the improvement wherein:

said pilot-burner includes a combustible gas inlet, an air inlet, a combustion plate with at least one combustion orifice at which combustion occurs under normal operating conditions and a mixing chamber means between said gas and air inlets and said combustion plate for ensuring thorough mixing of the combustible gas and the air; and an anti-deflagrating sleeve mounted on said pilot-burner over said combustion plate, said anti-deflagrating sleeve including a window at the top thereof and shutter means for opening said window when the pilot flame is not burning and automatically closing said window when the pilot flame is burning.

3,918,881

FUEL IGNITION CONTROL ARRANGEMENT

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

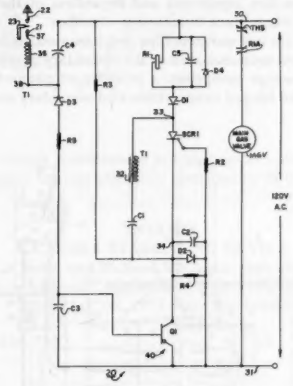
Filed Mar. 1, 1974, Ser. No. 447,167

Int. Cl.² F23Q *9/08*

U.S. Cl. 431—46 **16 Claims**

1. In a fuel ignition system having gas burner apparatus for burning gaseous fuel flowing thereto under the control of valve means in response to thermostatically-controlled switching means requesting ignition, and having means for igniting gaseous fuel, a control arrangement comprising spark producing means including an ignition transformer having a primary winding and a secondary winding, capacitor means, means including a bi-stable switching device connecting said primary winding and said capacitor means in a series unidirectional current path across a source of cyclical A.C. voltage for charging said capacitor means to a predetermined voltage during each first half cycle of the A.C. voltage, switching means including a controlled switching device having a pair of electrodes connected in a shunt circuit path across said capacitor means and said primary winding and a control electrode connected to a point of reference voltage, said controlled switching device being enabled responsive to each second half cycle of the A.C. voltage for causing discharge of said capacitor means through said primary winding for producing a pulse of current through said primary winding, a pair of ignition electrodes spaced apart to provide a gap therebetween and connected in a series circuit with said secondary winding whereby an ignition spark is generated between said electrodes when-

ever a pulse of current is provided in said primary winding, said electrodes being positioned so that ignition sparks between said electrodes will ignite gas from said gas burner apparatus to provide a flame which bridges the gap between said electrodes, said bi-stable switching device being energized in response to enabling of said controlled switching



device to deactivate said valve means, and thus terminate gas flow to the burner apparatus, and control means enabled whenever a flame bridges the gap between said electrodes to inhibit said controlled switching device thereby preventing the generation of further ignition sparks and disabling said bi-stable switching device whereby said valve means is activated to permit gas flow therethrough.

3,918,882

FLASH LAMP UNIT

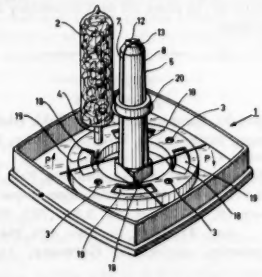
Jan Van Der Laan, Lagos, Nigeria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,225

Claims priority, application Netherlands, Apr. 24, 1973, 7305669

Int. Cl.² F21K *5/00*

U.S. Cl. 431—92 **6 Claims**



1. A flash lamp unit for cooperation with an associated camera, said unit including a base plate and a striker carried thereon, said striker including at least one pair of radially extending arms disposed in a common plane, an upstanding elongated member having one end fixed to the axial extremity of each arm which is closest to the other arm of said pair, a connection member joining the other ends of said upstanding elongated members fixed to said pair of radially extending arms, and means for holding each of said elongated members in fixed relation with respect to said base plate, said means including an upstanding pin and means attaching said elongated members to said pin.

3,918,883

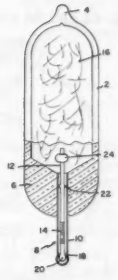
PHOTOFLASH LAMP

Donald E. Armstrong; Stephen V. Brown, and John W. Shaffer, all of Williamsport, Pa., assignors to Sylvania Electric Products Inc., Danvers, Mass.

Continuation of Ser. No. 887,005, Dec. 22, 1969, abandoned. This application July 19, 1974, Ser. No. 489,969

Int. Cl. F21k *5/02*

U.S. Cl. 431—93 **3 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of filamentary combustible material located within said envelope;

a combustion-supporting gas in said envelope; and,

a primer secured to and extending from one end of said envelope and in communication with the interior thereof, said primer including a wire anvil having a rough etched surface with a thin, adherent oxide coating thereon and a coating of percussion-sensitive fulminating material on a portion of said oxide coated, rough etched surface of the wire anvil.

3,918,884

ARRANGEMENT PROVIDED WITH SOME COMBUSTION FLASH BULBS

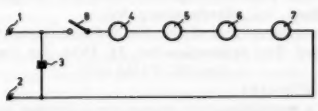
Johannes Gerardus Bok, and Petrus Johannes Julius Witterick, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,730

Claims priority, application Netherlands, May 1, 1973, 7306019

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 A **10 Claims**



1. A flash bulb assembly for cooperation with an associated camera providing sequential flashes, said assembly comprising a plurality of flash bulbs means connecting said flash bulbs in series each of said bulbs having a heating wire, two lead-through conductors connected to said ignition wire, and means for reducing the resistance between said lead-through conductors upon ignition of said bulb, one of said bulbs having a first resistance before ignition and a second resistance after ignition, a second of said bulbs having a third resistance before

ignition and a fourth resistance after ignition, said third resistance being smaller than said first resistance.

3,918,885

APPARATUS FOR REDUCING THE DYNAMIC PRESSURE OF COMBUSTION AIR AT THE BURNER HEAD OF AN OIL BURNING APPLIANCE

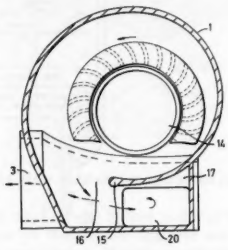
Bjorn Olov Magnus Palm; Karl Ivar Ake Gulliksson, and Bjorn Anders Christer Gustavsson, all of Norrkoping, Sweden, assignors to Bjorn Olov Magnus Palm, Norrkoping, Sweden

Filed Jan. 24, 1973, Ser. No. 326,340

Claims priority, application Sweden, Mar. 14, 1972, 3232/72

Int. Cl.² F23M 9/08

U.S. Cl. 431—182 **2 Claims**



1. An apparatus for reducing the dynamic pressure of combustion air at a burner head of an oil-fired appliance, said apparatus comprising in combination:

a blower made in the form of a radial impeller and having a casing;

an air supply pipe;

said casing having an air-intake opening and a flow-diverting edge disposed on the underside thereof, said casing having an outlet port disposed substantially tangentially to said edge and extending into a horizontal passage disposed under said edge;

said horizontal passage having a side wall with a second port disposed therein, said second port opening tangentially into said air supply pipe, said air supply pipe extending in a direction perpendicular to said horizontal passage and extending toward said burner head; and

said side wall being disposed to the side of said casing and directly below said air-intake opening of said casing, thereby changing the direction of flow of at least part of the combustion air during its passage from said blower to said burner head and thus reducing its dynamic pressure.

3,918,886

SECONDARY AIR CONTROL ARRANGEMENT FOR FUEL OIL BURNER

Frederick L. Runninger, Harrisonburg, Va., assignor to Dunham-Bush, Inc., Harrisonburg, Va.

Continuation-in-part of Ser. No. 395,882, Sept. 10, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,708

Int. Cl.² F23M 9/00

U.S. Cl. 431—184 **4 Claims**

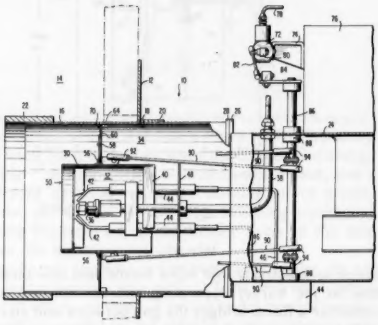
1. In a modulating fuel burner for a furnace or the like, having a first cylinder defining a blast tube positioned within the furnace combustion chamber, and forming an axial combustion air flow path, a second cylinder of smaller diameter concentrically positioned within said first cylinder and dividing the air flow into an inner primary combustion air flow path within said second cylinder and an outer secondary combustion air flow path between said cylinders, a fuel nozzle axially positioned within the second cylinder for discharging fuel into the primary combustion air flow path at a flow rate dependent upon burner demand, and means for igniting the fuel air mixture downstream of said nozzle, the improvement comprising:

movable flow restriction means positioned between said first and second cylinders for varying the cross sectional area of the secondary combustion air flow path, and

motor means operatively coupled to said flow restriction means for moving said flow restriction means to vary the secondary air flow only during burner operation in response to burner demand;

whereby, pulsation free combustion occurs under both high and low fire conditions and regardless of the pressure within the furnace combustion chamber,

and wherein said movable flow restriction means for varying the cross-sectional area of the secondary combustion air flow passage comprises; a plurality of circumferentially arranged hinged vanes within said secondary combustion



air flow path and hinged to the periphery of one of the cylinders and means coupling said motor means to said vanes for varying the angular position of said vanes between a position in line with the direction of flow of the secondary air and a position at right angles thereto, said vanes being hinged to the outer periphery of said second cylinder, a ring member being fixed to the inner periphery of the first cylinder generally in line with the hinges for said vanes, and said hinges being of a radial length such that the radial outer ends of at least some of said vanes contacts said ring member when moved to a position generally at right angles to the direction of flow of said secondary air, to close off said secondary combustion air flow passage.

3,918,887

LIGHTERS

Adolf Lamprecht, Hausen, and Hans Pohl, Dietzenbach, both of Germany, assignors to Rowenta-Werke, GmbH, Offenbach (Main), Germany

Continuation-in-part of Ser. No. 443,396, Feb. 19, 1974, Pat. No. 3,850,570, which is a continuation-in-part of Ser. No. 273,400, July 20, 1972, Pat. No. 3,837,787. This application Aug. 21, 1974, Ser. No. 499,394

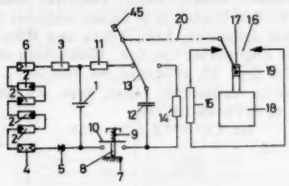
Claims priority, application Germany, Aug. 25, 1973, 2342963

Int. Cl.² F23Q 2/28

U.S. Cl. 431—255 **8 Claims**

1. An electrically ignited gas lighter including a photoelectric transducer, electrical storage means connected to said transducer for storing electrical energy developed thereby during illumination thereof, an ignition circuit including switch means manually operable to energize gas ignition means connected to said electrical storage means for lighting the lighter, the lighter having a gas tank the supply of gas wherefrom is controlled by a valve operatively connected with said switch means, printed circuit board means forming part

of said ignition circuit, said circuit board means supporting one of said electrical storage means and said ignition means,



and said circuit board means serving also as a structural support member for non-electrical components of the lighter.

3,918,888

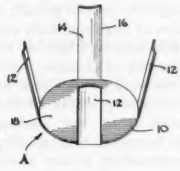
CANDLE STABILIZING DEVICE

Gladys E. Clarke, and Richard V. Clarke, both of 6033 S. Holt Ave., Los Angeles, Calif. 90056

Filed May 16, 1974, Ser. No. 470,613

Int. Cl.² F23D *3/16*

U.S. Cl. 431—297 **14 Claims**



1. An adapter for removable insertion into a socket of a candle holder for stabilizing a candle therein, said adapter comprising a base wall of overall size approximately equal to the size of a base of a candle, a plurality of upstanding arms spaced around the periphery of said base wall and which arms are somewhat arcuately shaped in vertical crosssection, each of said arms having a somewhat arcuately shaped inwardly presented wall to engage a candle between said arms, and an outwardly presented edge formed on each of said arms for engaging a socket wall in the candle holder, said arms being somewhat resilient so as to retentively engage said candle and to snuggly fit within the socket of said candle holder.

3,918,889

FLAME ARRESTOR

Joseph M. Green, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Apr. 12, 1972, Ser. No. 243,139

Int. Cl.² F23D *13/46*

U.S. Cl. 431—346 **3 Claims**

1. A mounting and housing for an industrial fluid fuel burner, including,

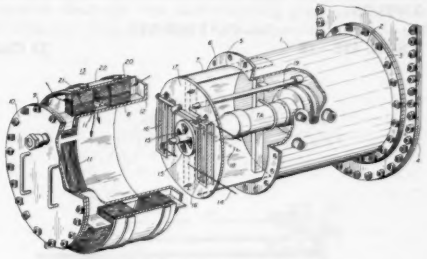
a first housing within which a fluid fuel burner may be mounted to discharge products of its combustion from a first opening of the housing,

a burner mounted within the housing at a position where its controls for fuel and air are readily accessible through a second opening of the housing,

means for removably connecting the housing to the end of a firetube so that the products of combustion are discharged into the firetube through the first opening,

a second housing removably connected over the second opening of the first housing and itself having two of three openings through which air flows for combustion,

means for removably sealing a first of the openings of the second housing,



and a screen-like flame arrestor mounted on the external surface of the second housing and adjacent the second opening so combustion air will flow through it and into the second opening.

3,918,890

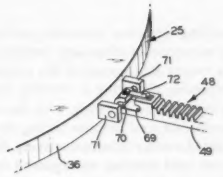
AUXILIARY OPERATORS FOR SLIDE DAMPERS

John C. Blaine, Ottawa, Ill., assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed July 1, 1974, Ser. No. 484,417

Int. Cl.² C21B *9/12*; F16K *11/00*

U.S. Cl. 432—54 **2 Claims**



1. In a reversing forced draft glass melting furnace of the type having a pair of regenerators adapted for periodic cycling, an ejector stack connected to each regenerator, an ejector nozzle mounted in each said stack, a reversing valve periodically and alternately communicating said nozzles with a source of combustion air and a source of ejection air, a slide damper associated with each said stack above each said nozzle to direct the flow of air in each said stack, a power means for automatically and periodically operating each said slide damper in conjunction with said reversing valve, the improvement comprising auxiliary operators for moving each said slide damper between open and closed positions and wherein each said auxiliary operator includes:

a. means for reciprocating its said slide damper between said open and closed positions in event of failure of said power means and comprising a movable rack;

b. means for mounting said reciprocating means on said ejector stack in substantially the same plane as said slide damper;

c. a manually operable force multiplying device operatively connected to said reciprocating means for imparting movement thereto; and

d. means for detachably connecting said reciprocating means to said slide damper, said detachable connecting means comprising a bail pin affixed to the end of said slide damper, and said rack being provided with a T-shaped slot for receiving said bail pin.

3,918,891

COOLER SYSTEM FOR ROTARY KILN AND METHOD

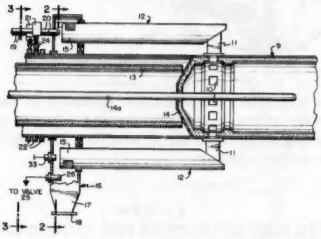
Sven Erich Theil, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed May 1, 1974, Ser. No. 466,050

Claims priority, application United Kingdom, May 9, 1973, 22097/73

Int. Cl.² F26B 9/12

U.S. Cl. 432—18 33 Claims



1. A method of cooling granular material exiting from a series of cooler tubes mounted in planetary fashion around a rotary drum such as a rotary kiln mounted for rotation about a rotational axis comprising directing a cooling liquid to at least one liquid carrying conduit rotating with the drum and positioned with its liquid exit end portion facing the material outlet end of its associated cooler tube, selectively discharging said cooling liquid from said conduit as reguired for cooling said granular material such that cooling liquid directed from said conduit to said cooler tube enters the material outlet end portion of the cooler tube and moves generally axially along the cooler tube so as to contact the hot granular material to provide cooling thereof as the material passes therethrough while simultaneously providing cooling of said granular material with air passing through said cooler tube in a direction opposite to the direction of material movement throughout at least a portion of the circular path of movement of said cooler tube.

13. A planetary cooler system for cooling hot material exiting from a rotary drum such as a rotary kiln which comprises an assembly of cooler tubes mounted in planetary fashion around the rotary drum with the axes of the tubes and the rotary axis of the drum in substantially parallel relation and arranged such that material treated in the drum passes from the exit portions of the drum into one end of each cooler tube and moves axially along the cooler tubes while being cooled by air passing in a direction opposite to the material through the tubes, at least one conduit capable of carrying a cooling liquid and mounted for rotation with the drum, said conduit being positioned with its liquid exit end portion facing the material outlet end of its associated cooler tube for simultaneous movement therewith, means for selectively directing a cooling liquid to said conduit and from said conduit into the material outlet end portion of the cooler tube throughout at least a portion of the circular path of movement of said cooler tube so as to contact the granular material to provide cooling thereof simultaneously with the cooling provided by air passing therethrough.

3,918,892

APPARATUS FOR HEATING A PIPE MADE OF A THERMOPLASTIC SYNTHETIC RESINOUS MATERIAL

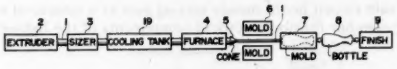
Masatoshi Shindo, Otake; Shiro Tsuchiya, and Kazuo Takegami, both of Osaka, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo and Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, both of, Japan

Filed Sept. 23, 1974, Ser. No. 508,561

Claims priority, application Japan, Sept. 25, 1973, 48-106894; Dec. 6, 1973, 48-135736

Int. Cl.² F27B 1/26, 9/28

U.S. Cl. 432—36 7 Claims



1. An apparatus for heating a pipe made of a thermoplastic synthetic resinous material comprising a heating chamber defined between an inner tubular member and an outer tubular member for heating the crystalline thermoplastic resinous pipe moving through the central portion of said inner tubular member, a plurality of partition walls extending through the entire length of said heating chamber to divide the heating chamber into a plurality of chamber portions, and a plurality of temperature measuring elements each element being mounted in one of said plurality of chamber portions and angularly displaced from one another circumferentially whereby each said temperature measuring element can effect control of the temperature in one of the chamber portions independently of one another.

6. An apparatus for heating a pipe made of a thermoplastic synthetic resinous material comprising at least two pipe guide wheels disposed in an inlet chamber and an outlet chamber respectively of a heating furnace for introducing the crystalline thermoplastic resinous pipe into the heating furnace and causing the pipe to move back and forth several times in the heating furnace by changing its direction of movement, and drive means connected to at least one of said guide wheels, said guide wheels including adjustable force transmitting friction rings for connecting said guide wheels to said drive means, said drive means and said adjustable force transmitting friction rings being operable to cause said guide wheels to forcedly advance the pipe when the pipe moves upwardly from a lower run to an upper run and to cause said guide wheels to be relatively freely driven by the moving pipe when the pipe moves downwardly from an upper run to a lower run.

3,918,893

ELONGATED ROTARY DRUM SHELL CONSTRUCTION

Orion C. Whitaker, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1974, Ser. No. 523,487

Int. Cl.² F27B 7/00

U.S. Cl. 432—103 6 Claims

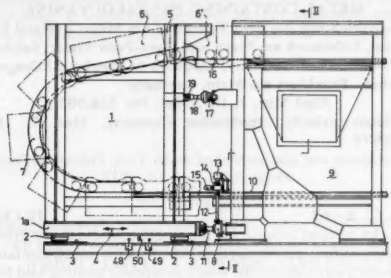
1. In a kiln having an elongated rotary drum comprising:

an elongated cylindrical inner shell;

an elongated cylindrical outer shell surrounding said inner shell in coaxial relationship; and,

a plurality of circumferentially spaced apart angular separators operably connected between said inner and outer shells having end connections with said inner and outer shells to provide for an angular connection between said shells, said separators having means to distort angularly

so that relative rotation between said inner and outer shells will occur to dissipate radial outwardly acting



forces from said inner shell due to expansion of said inner shell.

3,918,894

SINTERING MACHINE

Walter Stanke, Essen, and Gottfried Mertens, Kettwig, both of Germany, assignors to Heinrich Koppers GmbH, Essen, Germany

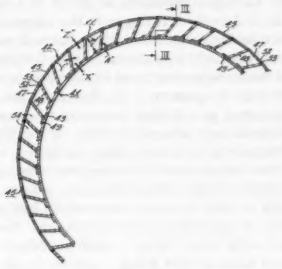
Continuation-in-part of Ser. No. 271,343, July 10, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 497,131

Claims priority, application Germany, July 9, 1971, 2134190

Int. Cl.² F27B 9/26, 21/06

U.S. Cl. 432—137 **10 Claims**

1. In a sintering machine, a combination comprising an elongated travelling grate having a plurality of pallet means; support means including two transversely spaced rail units supporting said grate for movement along an endless path defined by two upper rail unit portions each having a discharge end, two lower rail unit portions, and two at least partly curved connecting rail portions each forming a juncture with one of said upper and one of said lower rail unit portions at the respective discharge end, said travelling grate advancing in one direction along said upper rail unit portions towards said



discharge ends for travel via said connecting portions to said lower rail unit portions; displacing means engaging said connecting portions in the region of the juncture of the same with said lower rail unit portions, for effecting limited displacement of said connecting portions in longitudinal direction of said grate relative to said upper and lower unit portions; and two buffer means each engaging said connecting portions in the region adjacent said upper rail unit portions.

3,918,895

TRANSFER PRINTING METHOD

Shogo Mizuno, Toride, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

Filed Feb. 12, 1973, Ser. No. 331,347
Claims priority, application Japan, Oct. 9, 1972, 47-101408
Int. Cl.² D06P 5/00
U.S. Cl. 8—2.5 1 Claim

1. In a transfer printing method wherein a releasable layer is formed on a support; a pattern of an ink composition containing adye having a dyeability to fibers is formed on the releasable layer thereby forming with the support and releasable layer a transfer sheet; the pattern-formed surface of the transfer sheet is brought into contact with a fibrous article; the assembly of the transfer sheet and fibrous article is pressed or heated to transfer the pattern to the fibrous article; the fibrous article is subjected to a dyeing treatment to cause the dye of the ink composition to absorb to fibers of the fibrous article and the fibrous article is thereafter subjected to a soaping treatment, the improvement comprising employing as the main ingredients of the releasable layer, a resin and a solid solvent which is solid at room temperature but is capable of being molten at elevated temperatures and dissolving said resin therein, said resin being a rosin-modified maleic acid resin and said solid solvent being a acetylsalicylic acid.

3,918,896

DYE COMPOSITION FOR KERATINIC FIBERS CONTAINING AN OXIDATION BASE AND A META-AMINOPHENOL COUPLER

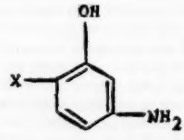
Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed June 24, 1974, Ser. No. 482,558
Claims priority, application France, June 22, 1973, 73.67861
Int. Cl.² A61K 7/13
U.S. Cl. 8—10.2 17 Claims

1. A dye composition for keratinic fibers comprising in combination in an aqueous or hydroalcoholic solution

a. at least one oxidation base selected from the group consisting of an aromatic and heterocyclic compound carrying either two amino groups or one amino group and one hydroxy group, fixed in para position relative to each other or the aromatic or heterocyclic nucleus of said compound, said oxidation base being in the form of a free base or in the form of an acid addition salt thereof and

b. at least one coupler of the formula:



[(I)]

wherein X represents a member selected from the group consisting of F, Cl and Br; or the acid addition salt thereof, said coupler being present in an amount of 0.05–3 percent based on the total weight of the composition and the molar ratio of said oxidation base to said coupler being between 6:1 and 1:2.

3,918,897

PROCESS FOR THE SINGLE-BATH DYEING OF UNMODIFIED POLYOLEFIN FIBERS WITH METAL-CONTAINING PHTHALOCYANINE

Hans-Ulrich von der Eltz, Frankfurt am Main; Armand Lehinant, Offenbach am Main, and Hans-Peter Maier, Sulzbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 1, 1973, Ser. No. 336,902
Claims priority, application Germany, Mar. 7, 1972, 2210879
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² D06P 1/14
U.S. Cl. 8—62 10 Claims

1. An exhaust process for the single-bath dyeing or printing of unmodified polypropylene fibers, with metal-containing phthalocyanine dyestuffs, which comprises treating said fibers under high temperature dyeing conditions with aqueous dispersions containing

a. metal-containing phthalocyanine dyestuffs having 2 to 4 quaternary ammonium groups linked over methylene bridges to the benzene nuclei of the phthalocyanine molecule,

b. alkyl or alkylenyl-polyglycol ether or oxethylated fatty acid polyglycol ester, and

c. anionic protective colloids comprising lignin-sulfonic acid.

3,918,898

HYDROGEN PEROXIDE BLEACHING SOLUTION AND METHOD

Jerome Katz, P.O. Box. 1544, Brighton, N.Y. 14603

Filed Dec. 6, 1972, Ser. No. 312,637
Int. Cl.² D06L 3/02
U.S. Cl. 8—111 10 Claims

1. A continuous process for scouring, desizing and bleaching cotton greige goods comprising the steps of:

a. immersing said goods in a deionized water bath to remove impurities from said goods;

b. immersing said goods for a time sufficient to achieve commercial brightness but less than about three and one-half minutes in an aqueous solution having a temperature in the range from 160°–212°F and consisting of from 1 to 10 percent by volume hydrogen peroxide, water and sufficient hydroxide to adjust said solution to a pH in the range from 10–14, said solution being substantially free of heavy metal ions and maintained out of contact with all metals while said goods are immersed therein;

c. continuously cycling a portion of said solution through a filtration means to remove solid impurities therefrom while maintaining the volume of said solution in contact with said goods substantially the same;

d. rinsing said goods with water to wash said aqueous solution therefrom; and

e. drying said goods.

3,918,899

CARBOXYMETHYL (CM) COTTONS PREPARED IN NON-AQUEOUS MEDIA

Dorothy M. Perrier, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 498,150
Int. Cl.² D06M 13/26
U.S. Cl. 8—120 10 Claims

1. An improved process for the preparation of carboxymethylated cotton, the process comprising reacting anhydrous sodium cellulosate with about 2.5 percent of a salt of mono-

chloroacetate in an anhydrous dimethylsulfoxide solution for from 6 minutes to 72 hours, depending upon the degree of substitution desired, under an inert, dry atmosphere, thereby producing a carboxymethylated fibrous cellulosic product which is insoluble in either acid or basic solutions.

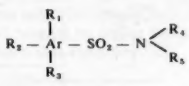
3,918,900

PROCESS FOR THE PAD-DYEING AND PRINTING OF TEXTILE MATERIAL OF POLYACRYLONITRILE WHICH CONTAINS SULFONIC ACID GROUPS

Sienling Ong, Lorsbach, Taunus, Germany; Helmut Diery, Paris, France, and Hans-Jurgen Weyer, Bergen-Enkheim, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 27, 1974, Ser. No. 483,565
Claims priority, application Germany, June 30, 1973, 2333412
Int. Cl.² D06P 5/00
U.S. Cl. 8—168 2 Claims

1. Process for the dyeing of textile material of polyacrylonitrile which contains sulfonic acid groups, which comprises using as carrier a compound of the formula



in which R_1, R_2 and R_3 each is hydrogen, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms or nitro, Ar is a phenyl or naphthalene ring, R_4 is hydroxy-alkyl of 1 to 4 carbon atoms, and R_5 is hydrogen, alkyl or hydroxy-alkyl of 1 to 4 carbon atoms, cyanoethyl, alkenyl of 2 to 4 carbon atoms, benzyl or cyclohexyl.

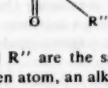
3,918,901

METHOD FOR COLORING FIBROUS MATERIAL COMPOSED OF PHENOLIC RESINS

Syunya Ida, Nara, and Norio Endo, Osaka, both of Japan, assignors to Kaneko Ltd., Tokyo, Japan

Filed Apr. 10, 1973, Ser. No. 349,771
Claims priority, application Japan, Apr. 14, 1972, 47-37897; June 19, 1972, 47-61622
Int. Cl.² D06P 5/06
U.S. Cl. 8—172 23 Claims

1. A method for coloring fibers or fibrous structures composed of phenolic resins, which comprises coloring said fibers or fibrous structures using a dye liquor which contains as a dyeing assistant at least one amide compound of formula



(I)

wherein R, R′ and R″ are the same or different and each represent a hydrogen atom, an alkyl group, a phenyl group, a benzyl group or a phenetyl group, but R, R′ and R″ do not represent hydrogen atoms at the same time.

3,918,902

DYEING OF SYNTHETIC ORGANIC MATERIAL WITH ALIPHATIC AND HALOGENATED ALIPHATIC SOLUTION

Hansruedi Hoster, Dornach, and Jurgen Markert, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 10, 1973, Ser. No. 349,893
Claims priority, application Switzerland, Apr. 12, 1972, 5356/72
Int. Cl.² D06P 1/68
U.S. Cl. 8—174 20 Claims

1. A process for the exhaust dyeing of synthetic organic material, the process comprising the step of contacting the synthetic organic material, at a temperature above 100°C, with a dye liquor consisting essentially of 20 to 75 percent by weight of a water-insoluble, aliphatic or cycloaliphatic hydrocarbon having 8 to 25 carbon atoms, and 80 to 25 percent by weight of a polyhalogenated, lower aliphatic hydrocarbon boiling between 70° and 180°C, and at least one finely-divided dispersion dyestuff which is difficutly soluble in boiling perchloroethylene.

3,918,903

DEHYDRATION PROCESS TO IMPART WRINKLE RESISTANCE TO CELLULOSE-CONTAINING FIBROUS MATERIALS

Russel M. Kullman, Metairie, and Robert M. Reinhardt, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 25, 1972, Ser. No. 274,949
Int. Cl.² D06M 13/34
U.S. Cl. 8—186 30 Claims

1. A process for imparting wrinkle resistance to cellulose-containing fibrous material comprising:

a. impregnating the cellulose-containing fibrous material with a formulation containing about from 2.5 to 35 weight percent of a crosslinking agent and about from 0.025 to 25 weight percent of an inorganic acid catalyst,

b. removing the excess quantity of formulation to obtain a wet pickup of about 60 to 100 weight percent, and

c. exposing the fibrous material of step (b) to a dehydrating atmosphere at ambient temperatures and pressures, for periods of time about from 30 minutes to 24 hours.

3,918,904

CONTROLLING EVAPORATION OF WATER

Joseph F. Vartiak, Naperville, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,855
Int. Cl.² B01J 1/18
U.S. Cl. 21—60.5 A 2 Claims

1. A method of retarding evaporation of a body of water to a predetermined rate by adding to the body of water a water soluble vinyl addition polymer in the form of acrylamide sodium acrylate copolymer in an amount sufficient to retard evaporation to said rate.

3,918,905

DIAGNOSTIC TEST FOR THE DETERMINATION OF SICKLING HEMOGLOBINOPATHIES

Bert Warren, Tuxedo Park, N.Y.; Gordon Crosby, Jr., East Orange, and George L. Evans, Hoptacong, both of N.J., assignors to Biological Corporation of America, Port Reading, N.J.

Filed July 20, 1973, Ser. No. 381,299
Int. Cl.² G01N 33/16, 21/06
U.S. Cl. 23—230 B 9 Claims

1. A method for testing blood for the presence of Hemoglobin S which comprises vigorously admixing a blood sample with a two-phase test system and determining the presence or

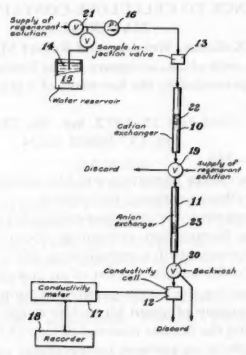
absence of Hemoglobin S after separation of the phases, said two-phase test system comprising (a) an aqueous phase containing on a weight/volume basis of about 38–45 percent total solids, said total solids consisting of a lysing agent in amounts up to about 2 percent of the total solids, a chemical reducing system in amounts up to about 22.4 percent of the total solids and a phosphate ion buffer system in amounts up to about 75.6 percent of the total solids, and (b) an organic phase immiscible with and lighter than said aqueous phase; the Hemoglobin S characteristic being determinable by the color of a band formed at the interface of the organic and aqueous phases and the hemoglobin genotype AS being determinable from the hemoglobin genotype SS by the color of the aqueous phase.

3,918,906

DETERMINING TOTAL IONIC CONTENT

Hamish Small, and Timothy S. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 386,263
Int. Cl.² G01N *27/08, 31/04, 31/08*
U.S. Cl. 23—230 R **4 Claims**



1. The method of determining total ionic content in an aqueous solution by quantitative analysis of a plurality of ionically dissociated compounds in the aqueous sample solution utilizing ion exchange procedures, which comprises:

adding a predetermined amount of said sample solution to a cation exchange resin bed means, said resin bed means being charged with a cation exchange resin in easily elutable cation form capable of exchanging with the cations of the sample and delivering only one species of cation on elution;

eluting from said resin bed means with water a congregated quantity of said easily elutable cations corresponding equivalent per equivalent to the number of equivalents of ion material dissolved in the said predetermined amount of sample solution;

passing the effluent from the cation exchange resin bed means through an anion exchange resin bed means, said latter resin bed means being in easily elutable anion form capable of exchanging with the anions of the sample and delivering only one species of anion on elution thereby exchanging all anionic species in said effluent for such easily elutable ions;

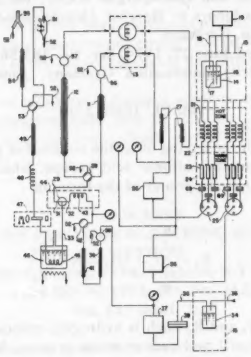
the total exchange capacity of the cation and anion exchange resins being sufficient to at least free, by ion exchange, a number of equivalents of each of the easily elutable cations and anions corresponding to the said number of equivalents of ionically dissociated compounds in the predetermined amount of sample solution; and passing the effluent from the anion exchange resin bed means through a conductivity cell having associated readout means and thereby quantitatively measuring the congregated quantity of easily elutable cations and anions.

3,918,907

MICRO AUTOMATIC AMINO ACID ANALYSIS PROCESS AND SYSTEM

Donald E. Stephens, Palo Alto, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 29, 1973, Ser. No. 410,541
Int. Cl.² G01N *31/08, 31/20, 31/22*
U.S. Cl. 23—230 R **16 Claims**



12. In the method of analyzing microsamples of amino acids which comprises the steps of:

supplying a buffer solution,

pressurizing the buffer solution with inert gas and forming a buffer stream,

metering the buffer stream,

injecting a microsample into the metered buffer stream,

delivering the metered buffer stream and microsample onto a separating column containing fine particle resins,

mixing the stream from the column with a ninhydrin reagent and

exposing the mixture to a source of heat for reaction to bring out color characteristic of amino acids,

the improvement which comprises refrigerating the buffer solution before it enters the buffer stream, thereafter de-gassing the buffer stream before metering and injection of the sample into the buffer stream.

3,918,908

METHOD FOR PROTHROMBIN TESTING

Rudolph H. Moyer, West Covina, and Donald J. Sibbett, Cucamonga, both of Calif., assignors to Geomet, Incorporated, Gaithersburg, Md.

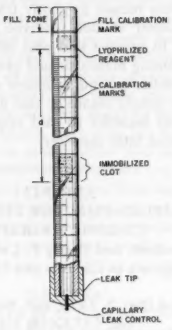
Filed May 17, 1974, Ser. No. 470,894
Int. Cl.² G01N *11/12, 33/16*
U.S. Cl. 23—230 B **15 Claims**

1. Method of reproducibly measuring changes of viscosity in a liquid sample subject to an increase in viscosity after combination with at least one reagent capable of altering said sample viscosity comprising:

A. injecting said sample into a hollow cylinder having an internal diameter sufficiently large so as to substantially eliminate effects of initial sample viscosity said injecting

step including combining said sample with at least one said reagent;

B. passing said sample and reagent combination in said cylinder by supporting said cylinder in such a manner that



gravity causes said sample to move in a downward direction; and

C. gauging the time required for said increase in viscosity of said sample and reagent by noting the distance said sample travelled down said cylinder.

3,918,909

APPARATUS FOR PERFORMING SATURATION ANALYSES

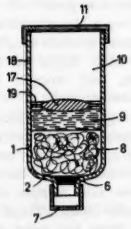
Jan Jacob Arlman, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 20, 1972, Ser. No. 290,650

Claims priority, application Netherlands, Sept. 21, 1971, 7112927

Int. Cl.² G01N *31/06*; B01L *3/00*

U.S. Cl. 23—253 R **3 Claims**



1. A device suitable for performing a saturation analysis in which by the use of a separating agent a radioactive-substance bound to a competitive binder is separated from its unbound form which device comprises a tubular member open at both ends and containing in a lower part the separating agent and containing in an upper part a reaction compartment containing a radioactive reagent, said reaction compartment being a container closed with respect to the separating agent and having a non-porous bottom portion facing the separating agent which may be rendered permeable to liquid and said non-porous bottom portion including a hydrophobic porous filter capable of being made permeable to liquid by shaking or by providing a pressure differential between the reaction compartment and the remainder of the tubular member.

3,918,910

SYSTEM FOR DETECTING THE PARTICULAR CHEMICAL CONSTITUENT OF A FLUID

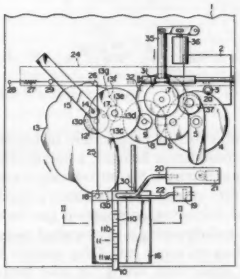
Isao Soya; Katsuhiko Kimura; Tooru Nobuto, and Yawara Nagai, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 24, 1974, Ser. No. 491,521

Claims priority, application Japan, July 31, 1973, 48-85395; July 31, 1973, 48-89928[U]; July 31, 1973, 48-88929[U]; July 31, 1973, 48-88930[U]

Int. Cl.² G01N *33/16, 21/30*

U.S. Cl. 23—253 R **4 Claims**



1. A system for detecting the particular chemical constituent of a fluid, comprising:

a test sheet support having a roller fixed thereto for supporting a chemical reaction test sheet provided with a plurality of carriers containing different reagents;

photoelectric detection means including a first light-emitting element for emitting a light on a selected one of said reagent carriers, and a first photoelectric element for receiving a reflectd light from said selected reagent carrier to generate an electrical signal corresponding to the degree of chemical reaction between the test fluid and the reagent contained in said selected carrier;

a measuring circuit connected to receive said electrical signal generated by said first photoelectric element;

a stepped cam having a plurality of signal holes therein and an operating surface having a plurality of steps which are located with a predetermined correspondence to said signal holes;

driving means coupled to said stepped cam for rotating said stepped cam;

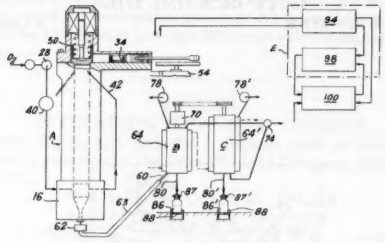
means for pressing said roller of said test sheet support against said stepped operating surface of said stepped cam so as to intermittently shift the test sheet according to the rotation of said stepped cam; and

a signal generator coupled to said measuring circuit and having a second light-emitting element for emitting a light through said signal holes, and a second photoelectric element for receiving light transmitted through said signal holes and for generating a measuring command signal, said measuring command signal being applied to said measuring circuit in response to said second photoelectric element receiving light transmitted through said signal holes.

3,918,911
METHOD AND APPARATUS FOR PREPARATION OF LIQUID SAMPLES

Andrew Reich, Versailles, France, assignor to Intertechnique S.A., Plaisir, France

Filed Sept. 28, 1971, Ser. No. 184,373
Claims priority, application France, Oct. 9, 1970, 70.36644
Int. Cl. G01n *31/12*
U.S. Cl. 23—253 PC **15 Claims**

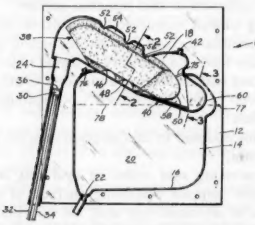


7. An apparatus for the preparation of liquid samples, having: a vertical combustion furnace; a bed of combustion catalyst in said furnace; means for introducing oxygen at a predetermined flow rate into said furnace above said bed; means for continuously withdrawing combustion gas from said furnace under said bed and directing it to cascaded means for selective solvent collection of water and CO_2; sample loading means comprising an upper end fitting for said furnace, a vertical passage formed in said fitting and communicating with said furnace, a radial passage formed in said fitting and opening into said vertical passage, a seat formed in said vertical passage between said radial passage and said furnace, a valve member movable between a normal position where it closes said seat and an open position where it clears said seat and the opening of said radial passage, means for introducing starting samples one at a time along said passage and means for forcibly opening said valve member in response to said introduction.

3,918,912
BLOOD OXYGENATOR

Daniel A. Talonn, University City, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,455
Int. Cl.² A61M *1/03*
U.S. Cl. 23—258.5 B **8 Claims**

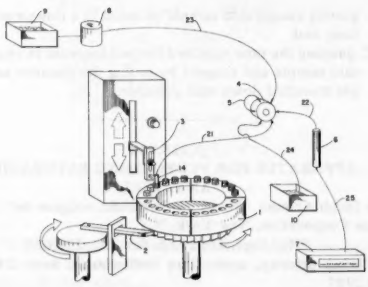


1. A blood oxygenator comprising an oxygenating chamber, means for delivering venous blood and oxygenating gas to said oxygenating chamber for producing foamed blood in said oxygenating chamber to oxygenate the blood, a reservoir for receiving oxygenated blood and having an outlet for discharging oxygenated blood, said reservoir being normally filled with blood to an operating blood level, indicia means including a visual mark in fixed relation to said chamber providing a visual indication of said operating blood level, defoaming means including a defoaming chamber connected between said oxygenating chamber and said reservoir, and a defoaming member in said defoaming chamber for removing gas from said foamed blood, a funnel member connected to the downstream end of said defoaming chamber and inclined downwardly toward said reservoir with the lower end thereof disposed below said indicia means to gently transfer blood from said defoaming chamber to said reservoir, said funnel member being disposed to receive and pass all of the blood flowing from said defoaming means to said reservoir and said outlet, and a filter member extending below said lower end of said funnel and said indicia means so that all of the blood flowing from said funnel member to said reservoir and said outlet flows through said filter member.

3,918,913
SAMPLER-INJECTOR FOR LIQUID CHROMATOGRAPHY

Charles E. Stevenson, and Henry F. Coffey, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 2, 1974, Ser. No. 528,607
Int. Cl.² G01N *1/14*
U.S. Cl. 23—259 **20 Claims**



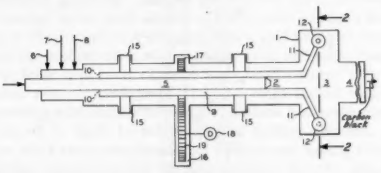
1. An automatic sampler-injector for use with a liquid chromatographic column comprised of, in combination:

I. a sample container comprised of:
  a. a cylinder having a closed end and an open end; and
  b. a stopper adapted to slide snugly into the open end of said cylinder, after liquid to be sampled has been placed therein, said stopper being adapted to be pierced by a needle; and

II. means for removing a sample from said sample container, measuring said sample, and injecting said sample into said liquid chromatographic column comprised of:
  a. a sharply pointed hollow needle spatially disposed vertically above said sample container, said needle having an annular collar affixed therearound at a sufficient distance from the point thereof to permit said point of said needle to penetrate said stopper;
  b. means for positioning said sample container beneath said needle so that said sample container and said needle are in the same vertical plane;
  c. means for contacting said stopper in said sample container with said needle, piercing said stopper with said point of said needle, contacting said stopper with said collar and moving said stopper toward the closed end of said cylinder, said movement ending when the point of said needle nears the closed end of said cylinder, and then reversing said movement until said cylinder and said needle-collar assembly are returned to their starting position;
  d. a conduit connecting said needle with the first port of a six port valving means;

e. a discharge conduit connected to a second port of said valving means;
f. a sampling loop connected to a third and fourth port of said valving means;
g. means for flushing a sample from said sampling loop into said liquid chromatographic column connected to a fifth port of said valving means;
h. a conduit to said liquid chromatographic column connected to the sixth port of said valving means;
i. means for aligning the first port with the fourth port, the second port with the third port, and the fifth port with the sixth port of said valving means as said needle contacts said stopper, and means for aligning the first port with the second port, the third port with the sixth port, and the fourth port with the fifth port of said valving means as said cylinder and said needle-collar assembly are returned to their starting positions;
j. means for flushing said sample from said sampling loop into said chromatographic column; and
k. means for advancing the next sample container to a position directly beneath said needle.

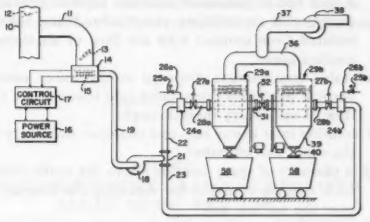
3,918,914
CARBON BLACK REACTOR
Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 253,027, May 15, 1972, abandoned, Division of Ser. No. 830,611, June 5, 1969, Pat. No. 3,681,031. This application Oct. 15, 1973, Ser. No. 406,385
Int. Cl. C09c *1/50*
U.S. Cl. 23—259.5 **5 Claims**



1. A carbon black reactor comprising
a. a tubular combustion section;
b. a tubular reaction section downstream of and in contiguous axial alignment with and operatively connected to said combustion section;
c. first means operatively connected to said reactor for axial introduction of hydrocarbon feed into said combustion section;
d. second means for tangentially introducing combustion gases into said combustion section, said second means being arranged for rotation around the axis of said reactor;
e. third means for rotating said second means around the axis of said reactor; and
f. fourth means for the removal of effluent from said tubular reaction section.

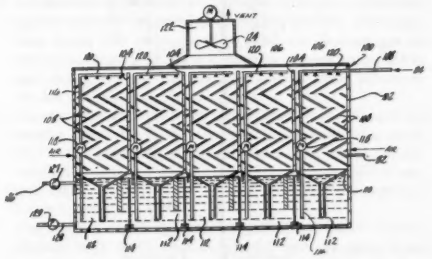
3,918,915
POLLUTION ABATEMENT SYSTEM
George J. Holler, Jr., 210 S. Marietta St., St. Clairsville, Ohio 43950
Filed Jan. 8, 1973, Ser. No. 321,781
Int. Cl.² B01D *53/34*; B01J *8/10, 1/14*
U.S. Cl. 23—262 **11 Claims**

1. In a pollution abatement system for purifying waste gas containing SO_2, the combination of an afterburner, means for directing waste gas into said afterburner, heating means within said afterburner for burning combustible materials in said waste gas, and waste gas conditioning means comprising a drum containing a bed of loose granular media which is chemically-reactive with at least the sulfur dioxide component in the waste gas, said drum including a rim section into which there is formed perforations for discharge from the drum of reacted material abraded from said media and purified waste gas, conduit means for conducting waste gas from said afterburner into said drum, means for continuously rotating said



drum to abrade the surface of said media and maintain a chemically-reactive surface thereon, a housing for enclosing said drum, said housing having a chamber for receiving reacted material abraded from said media, closure means for said chamber, and exhaust means communicating with said housing for discharging purified waste gas passing from said drum.

3,918,916
PLURAL CHAMBER SERIAL FLOW FORCED AIR COOLED CRYSTALLIZER
Donald E. Garrett, Claremont, Calif., assignor to Donald E. Garrett, Claremont, Calif.
Continuation-in-part of Ser. No. 246,396, April 21, 1972, abandoned, which is a division of Ser. No. 726,149, May 2, 1968, abandoned. This application July 10, 1974, Ser. No. 487,287
Int. Cl.² B01D *9/02*; C01D *3/08*
U.S. Cl. 23—273 MT **6 Claims**



1. An apparatus for crystallizing potassium chloride from a solution of potassium chloride and sodium chloride comprising:
a. a housing including a plurality of substantially vertical, transverse partitions defining a plurality of cooling chambers including end chambers for serial passage of the solution therethrough, each cooling chamber including a downwardly inwardly inclined drip pan in the lower portion thereof to define an upper cooling zone and a lower cooling zone below said drip pan, a flow passageway in the apex of said drip pan connecting said upper cooling and said lower zones, the sides of said housing and the transverse partitions being air-premeable above said drip pan and solid below said drip pan;
b. a plurality of fixed vertically staggered inclined baffle elements disposed within the cooling chambers above said drip pans and over which the solution is passed;
c. means for inducing forced air flow at a temperature substantially lower than that of the solution, through the

air permeable walls upwardly and out through an exhaust above said chambers such that cooling of the solution occurs by sensible heat exchange with the air;

d. at least one crystallizing receptacle disposed within the lower cooling zone of each chamber for receiving the cooled solution from the upper cooling zone and wherein controlled crystal growth of potassium chloride occurs on a seed bed of potassium chloride crystals contained in a slurry, said crystallizing receptacles being substantially isolated from contact with the flow of air through said cooling zones;

e. valve passageways disposed at the lower ends of the vertical partitions connecting said lower zones for serial flow of said slurry therethrough;

f. solution inlet in one said end chamber and slurry outlet in the other end chamber;

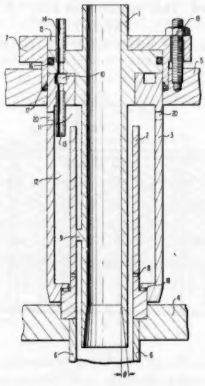
g. a plurality of spray nozzles above the baffle elements of each cooling chamber for directing the flow of solution over the baffles; and

h. conduit means including pump means associated with each chamber for passing solution from the crystallizing receptacles to said spray nozzles.

3,918,917
APPARATUS FOR REACTING ORGANIC COMPOUNDS AND SULFUR TRIOXIDE

Yoshiro Ashina; Yasumasa Yamaguchi, and Atushi Fujiwara, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd. and Nippon Unitol Co., Ltd., both of Tokyo, Japan

Filed Apr. 16, 1973, Ser. No. 351,387
Claims priority, application Japan, Apr. 15, 1972, 47-37374
Int. Cl.² B01J *10/00*; **C07C** *141/02*, *141/10*, *143/02*
U.S. Cl. 23—283 **8 Claims**

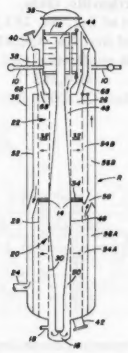


1. A multi-tube thin-film type reaction apparatus for the reaction of a liquid organic compound and gaseous sulfur trioxide, said apparatus comprising a plurality of tube assemblies comprising a reaction tube provided with a gas- and liquid-feeding structure at the upper portion of the reaction tube, characterized in that: the reaction tubes are provided substantially vertically and have an inner diameter of 16–90 mm, an inner tube of a diameter substantially equal to that of the reaction tube and having liquid-distributing holes of 1–3 mm in diameter is provided at the top end of each reaction tube, said inner tube being surrounded by an outer tube to form a liquid receiver between both tubes, liquid organic compound feed means communicating with said liquid receiver, a reaction gas nozzle inserted in the interior of said inner tube and communicating with and at least partially extending into said reaction tube to permit the substantially uninterrupted flow of reaction gas from the reaction gas nozzle to said reaction tube, the lateral clearance between said reaction tube and said reaction gas nozzle being greater than 2 mm and the end of said reaction gas nozzle being 5 – 300 mm below said liquid-distributing holes, a pressure-leveling opening being provided between the upper portion of said liquid receiver and the upper portion of said inner tube, and liquid organic compound feed means is provided where at least a portion of each liquid organic feed means having an inner diameter of 0.5 – 5 mm and a length/inner diameter ratio of 10 – 1,000 to render the flow resistance from the source of liquid organic compound to the liquid receiver within the range 0.1 – 0.8 Kg/cm².

3,918,918
CATALYTIC REACTOR

Harold B. Kohn, Cedar Grove, and George Friedman, Clark, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 234,831, March 15, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,569
Int. Cl.² B01J *8/04*, *8/00*
U.S. Cl. 23—288 K **5 Claims**



1. A catalytic reactor for two stage reactions in a single catalyst bed with interstage feed-effluent heat exchange comprising:

an upright, cylindrical reactor vessel;

an elongated annular catalyst bed secured in but spaced from said vessel by annular perforated wall means in coaxial alignment with that of said vessel;

a heat exchanger having a shell side and a tube side adjacent one end of said bed;

seal means within said catalyst bed and dividing same into a lower first stage and an upper second stage;

means including reactant fluid deflector means dividing the annulus defined by said bed into upper and lower feed chambers corresponding to said first and second stages;

a fluid inlet communicating with the inlet on one side of said heat exchanger;

a fluid outlet from said one side of said heat exchanger;

means communicating with said fluid outlet of said one side of said heat exchanger with said lower first stage;

means between said first stage and said vessel for receiving first stage effluent and communicating with the inlet on the other side of said heat exchanger;

means communicating with the outlet of said other side of said heat exchanger and said upper second stage;

reactor effluent outlet; and

means between said second stage and said vessel for receiving second stage effluent and communicating with said reactor effluent outlet.

3,918,919
REACTOR FOR THE PREPARATION OF HALOGENATED COMPOUNDS FROM HYDROCARBONS

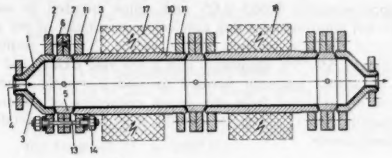
Richard Walburg, Schwalbach, Taunus; Helmut Gerstenberg, Fischbach, Taunus, and Hans Osterbrink, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 21, 1973, Ser. No. 372,018

Claims priority, application Germany, June 24, 1972, 2231049

Int. Cl.² B01J *3/04*; **C01B** *9/00*; **F16L** *21/04*, *58/00*

U.S. Cl. 23—290 **6 Claims**



1. A reactor for the preparation of halogenated compounds from hydrocarbons, at temperatures of from 400° to 800°C. and under pressures of from 50 to 700 kp/cm² comprising a plurality of cylindrical reactor units, said reactor units having internal bores and being aligned on a common longitudinal axis with said internal bores in axial alignment with each other; a sealing element positioned between and connecting the adjacent ends of each of said aligned reactor units; said sealing element comprising a nickel core having an internal bore located generally in alignment with the bores of its adjacent reactor units; each of said reactor units having a nickel lining on their respective internal bores, said lining extending beyond the end portions of the reactor units and being flanged over at least a portion of their associated reactor unit end portions; two circumferential flanged rings bolted together surrounding said sealing element in a plane perpendicular to the axis of its bore to reinforce said sealing element, said reactor units being independently heated and having radially extending circumferential flanges secured thereto adjacent their respective end portions, a plurality of expansion bolts extending through all of said flanges, and spring means cooperating between said flanges and said bolts for compressing said sealing element between the flanges of said nickel lining.

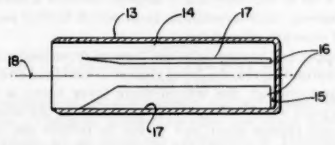
3,918,920
HOLDER FOR SAMPLE CONTAINERS OF DIFFERENT SIZES

Duane G. Barber, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 7, 1974, Ser. No. 431,506

Int. Cl.² B01L *11/00*

U.S. Cl. 23—292 **6 Claims**



1. A holder for articles of various sizes comprising:

a plurality of longitudinally extending flexible ribs spaced around a center axis, each rib having longitudinally extending inner and outer edges and further having a surface adjacent the inner edge thereof for supporting an article within the holder;

a cylinder having an interior surface for supporting the outer edge of each rib, the ribs extending inward therefrom toward the center axis and being deflectable in a direction away from the center axis to accommodate articles of various sizes within the holder; and

each rib, when undeflected, being angularly displaced with respect to a radius connecting the center axis and the outer edge of the rib, whereby insertion of articles of various sizes into the holder deflects the ribs in the same direction.

3,918,921
PROCESS FOR MAKING GRANULAR HYDRATED ALKALI METAL SILICATE

Richard H. Pierce, Broomall, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 143,627, May 14, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,702

Int. Cl.² B01F *3/06*; **C01B** *33/32*; **C01D** *11/00*

U.S. Cl. 23—313 AS **5 Claims**

1. In the process for producing granules consisting essentially of a plurality of hydrated amorphous alkali metal silicate particles bonded together at touching surfaces, having an SiO_2/M_2O mol ratio of 1.2 to 4.0/1.0, the improvement whereby said product is produced in a continuous spray drying process which results in a product having 10 to 30% equilibrated moisture and a tamped bulk density of 20 to 55 lbs/cu.ft. comprising:

a. maintaining a spray dryer with a gas inlet temperature of 250° to 500°F and a gas outlet temperature of 160° to 250°F;

b. injecting an atomized aqueous alkali metal silicate solution into said spray dryer so that apparently dry particles are formed during the passage through the spray dryer;

c. entraining said particles in a gas flowing at 100 to 250 ft/min;

d. conducting said entrained particles through a collection system wherein the particles having a particle size larger than about 100 mesh separate from the flowing gas by gravity because they are too large to remain entrained in said gas flow while the particles smaller than 100 mesh remain entrained in the gas flow;

e. injecting the gas flow with said entrained small particles smaller than 100 mesh into said spray dryer at a point above the injection point for the alkali metal silicate solution so that the falling particles encounter said atomized alkali metal silicate solution and agglomerates are formed, and

f. maintaining the feed rate of said alkali metal silicate solution such that the solids injected into the spray dryer are equal to the product solids removed in the collection system.

3,918,922
METHOD FOR MAKING METAL-TO-CERAMIC SEALS

Norman C. Anderson, 1526 Beach Park Blvd., Foster City, San Mateo County, Calif. 94404

Division of Ser. No. 148,891, June 1, 1971, Pat. No. 3,736,650. This application Feb. 7, 1973, Ser. No. 330,376

Int. Cl. B22f *7/02*

U.S. Cl. 29—182.3 **18 Claims**

1. A brazing mixture comprising a volatile vehicle in which is suspended a powdered mixture comprising by weight a majority of columbium powder and a second metal powder selected from a class consisting of iron and nickel.

3,918,923
WEAR RESISTANT SINTERED ALLOY

Hiroshi Inoue, Kashiwazaki, Japan, assignor to Riken Piston Ring Industrial Co., Ltd., Tokyo, Japan

Filed July 25, 1973, Ser. No. 382,307
Claims priority, application Japan, Aug. 16, 1972, 47-81410
Int. Cl.² B22F *1/00*
U.S. Cl. 29—182.5 **6 Claims**

1. A method of preparing a wear-resistant iron-base alloy comprising the steps of:

preparing a powder mixture comprising 1.0–1.8% carbon, 0.5–2.0% chromium, 0.5–1.0% nickel, 2.0–8.0% of one or more metal sulfides selected from a group consisting of aluminum sulfide, cobalt sulfide, tungsten sulfide, copper sulfide, lead sulfide, and molybdenum sulfide, and the balance iron;

compressing said powder mixture into a form;

sintering said form at a temperature below the melting point of said one or more metal sulfides;

maintaining said form at temperatures up to said sintering temperature to distribute the sulfur of said one or more metal sulfide substantially in the microstructure of said alloy as iron sulfides, and the metal of said one or more metal sulfides substantially uniformly within the matrix of said alloy; and

cooling said form to room temperature.

4. A wear resistant sintered alloy prepared from a mixture of powders comprising:

1.0–1.8% carbon, 0.5–2.0% chromium, 0.5–1.0% nickel, 2.0–8.0% of one or more metal sulfides selected from a group consisting of aluminum sulfide, cobalt sulfide, tungsten sulfide, copper sulfide, lead sulfide, and molybdenum sulfide, and the balance iron;

said alloy having a sintered microstructure comprsing a pearlite matrix, free cementite located at grain boundaries, and pores, and wherein

the sulfur of said one or more metal sulfide is distributed substantially in said microstructure as iron sulfide inclusions, and the metal of said one or more metal sulfides is distributed substantially uniformly within said matrix.

3,918,924
METHOD FOR PRODUCING WEAR-RESISTANT FERROUS SINTERED METAL CONTAINING HIGH AMOUNTS OF TITANIUM CARBIDE GRAINS AND CARBON PARTICLES

Akira Shibata, Yokohama, Japan, assignor to Chugai Electric Co., Tokyo, Japan

Division of Ser. No. 262,281, June 13, 1972, Pat. No. 3,782,930. This application Sept. 18, 1973, Ser. No. 398,390
Int. Cl.² C22C *1/10*
U.S. Cl. 29—182.8 **6 Claims**

1. A ferrous-titanium carbide composition characterized by resistance to scuffing and wear comprising metallographically a ferrous matrix in which substantially all of the contained titanium carbide is in the form of fine precipitated grains substantially below 5 microns in size, said matrix containing particles of precipitated graphite uniformly dispersed therethrough at substantially less than 10 microns in size.

4. As an article of manufacture, a scuff and wear-resistant element formed of a sintered ferrous-titanium carbide composition, said element being characterized metallographically by a ferrous matrix in which substantially all of the contained titanium carbide is in the form of fine precipitated grains substantially below 5 microns in size, said matrix containing particles of precipitated graphite uniformly dispersed therethrough at substantially less than 10 microns in size.

3,918,925
ABRADABLE SEAL

Charles C. McComas, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1974, Ser. No. 469,270
Int. Cl.² B22F *3/00*
U.S. Cl. 29—182.3 **5 Claims**

1. An abradable seal for use between two relatively rotatable members in elevated temperature operating apparatus comprising:

a nickel aluminide coating approximately 0.005–0.010 inch thick bonded to one of said members;

a voidless, inorganic water insoluble spinel compound layer approximately 0.005–0.05 inch thick bonded to said nickel aluminide coating consisting essentially of the air cured reaction product of, by weight, 20–40% sodium silicate, 55–75% aluminum and 2–8% zinc oxide; and

an abradable material bonded to said inorganic binder coating selected from the group consisting of sintered metallic fiber, sintered metallic powder and metallic honeycomb.

3,918,926
PLURAL COPPER-LAYER TREATMENT OF COPPER FOIL AND ARTICLE MADE THEREBY

Adam M. Wolski, and Charles B. Yates, both of Edgewater Park, N.J., assignors to Yates Industries, Inc., Bordentown, N.J.

Filed Oct. 8, 1971, Ser. No. 187,923
Int. Cl.² B23P *3/00*; C25D *3/58, 5/10*
U.S. Cl. 29—195 **24 Claims**

1. A process for improving the bond strength of copper foil through the electrochemical treatment of a surface thereof comprising subjecting said surface to a two-step electrochemical pretreatment prior to the application of said electrochemical treatment, the first step of said pretreatment comprising subjecting said surface to an arsenic and copper-containing electrolyte under conditions such as to electrolytically deposit thereon a first copper layer which increases the bond strength of the raw foil; the second step of said pretreatment comprising subjecting said surface to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a second copper layer which substantially conforms to the configuration of the first layer and reduces the powder transfer characteristics of said first layer; and then giving said pretreated foil an electrochemical treatment in which said surface is subjected to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a third, copper-containing, microcrystalline layer which further increases the bond strength of said foil.

21. Copper foil having on a face thereof three electrodeposited superposed layers, the layer closest to said face containing arsenic and copper, the intermediate layer being a copper electrodeposit which substantially conforms to the configuration of said closest layer and serves to reduce the powder transfer characteristics of said closest layer; the third outermost layer being copper-containing and microcrystalline, said third layer increasing the bond strength of said foil over and above the bond strength provided by said closest and intermediate layers.

23. A printed circuit board comprised of a dielectric substrate bonded to which is the copper foil of claim **21**, the portion of said foil being closest to said substrate being said third layer.

3,918,927

ELECTROPLATING POLYPROPYLENE

Johnny L. Wells, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 20, 1974, Ser. No. 481,198
Int. Cl.² B23D *3/20*; C25D *5/54*
U.S. Cl. 29—195 5 Claims

1. A process for electroplating a moldable propylene polymer which comprises the steps of

1. incorporating a nonporous natural silica filler having a particle size in the range of 1 to 50 microns, a surface area in the range of 1 to 40 cm^2/g and an oil absorption value in the range of 15 to 40 grams of oil per 100 grams filler into said polymer;
2. molding the resulting composition of propylene polymer and filler;
3. conditioning the molded propylene polymer product of stpe (2) by contacting same with an acid chromate etch consisting of 28.1 to 33.0 weight percent H_2SO_4, 23.8 to 26.4 weight percent CrO_3 and 40.6 to 48.1 weight percent H_2O for a period of 0.1 to 20 minutes at a temperature in the range of 75° to 200° F.;
4. preplating the resulting conditioned polymer product of step (3) with an electrolessly platable metal; and
5. electroplating the preplated product of step (4) with a final metal finish to obtain a metal-plated propylene polymer product.

3. The product of the process of claim 1.

3,918,928

SHANK OR BACK MATERIAL FOR HIGH SPEED STEEL TOOLS

Kingo Kiyonaga, Yonago, and Haruki Hada, Yasugi, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Division of Ser. No. 164,298, July 20, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,441
Claims priority, application Japan, Sept. 14, 1970, 45-79950
Int. Cl. B23p *15/18*; C22c *39/14*
U.S. Cl. 29—196.1 5 Claims

1. In a tool including a tool portion of known high speed steel material and a shank or back portion welded to said tool portion, the improvement comprising said shank or back portion being of a steel material consisting of 0.2–0.6% of carbon, 3.0–7.0% of chromium, 0.1–1.0% of vanadium, 0–0.3% of niobium, not more than 0.8% of silicon, not more than 0.8% of manganese and the remainder of iron and inevitable impurities, wherein said steel material of said shank or back portion prevents decarburization or cementation in the weld between said shank or back portion and said tool portion respectively, said shank or back portion maintaining its toughness when the tool is subjected to heat treatment at high temperatures, and said steel material of the shank or back portion having an HRC hardness of more than 40 when subjected to said heat treatment under the same tempering conditions as for said high speed steel tool portion, said steel material of the shank or back portion having good, crack-free weldability with said high speed steel tool portion.

3,918,929

PROCESS FOR POST-TREATING HOT BRIQUETTES AND THE LIKE

Paul Schmalfeld, Bad Homburg; Helmut Hahn, Hanau; Joachim Lehmann, Essen-Haarzopf, and Kurt Kleisa, Essen-Frintrop, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 16, 1973, Ser. No. 389,052
Claims priority, application Germany, Sept. 26, 1972, 2247101
Int. Cl.² C10L *5/00*
U.S. Cl. 44—10 K 6 Claims

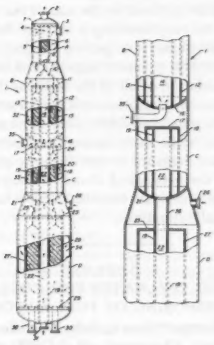
1. Process for post-treating hot briquettes or similar shaped bodies containing caking coal which have been made at temperatures between about 350° and 550°C., which comprises conveying the hot briquettes through a shaft zone countercurrent to oxygen-containing gases, thereby raising the temperature of said briquettes to from 50°–200°C above said shaping temperature by combustion within said shaft zone of carbon of the briquettes and of gases and tar released by the briquettes when so heated.

3,918,930

COUNTERCURRENT CATALYTIC CONTACT OF A REACTANT STREAM IN A MULTIPLE-STAGE PROCESS AND THE APPARATUS THEREFOR

James T. Forbes, Arlington Heights, and James E. Gantt, Elmwood Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 399,775, Sept. 20, 1973. This application Aug. 27, 1974, Ser. No. 501,001
Int. Cl.² C10G *11/28*
U.S. Cl. 48—214 4 Claims



1. A process for effecting the multiple-stage, countercurrent contact and conversion of a hydrocarbon reactant stream with hydrocarbon conversion catalyst particles movable through said stages via gravity-flow, which process comprises the steps of:

a. introducing a first portion of said reactant stream into a reaction chamber, containing at least two vertically-disposed reaction zones, at a locus intermediate said reaction zones;
b. passing said first portion downwardly through the lower of said reaction zones and flowing said portion laterally, in radial flow, through a first annular-form catalyst bed, in which the catalyst particles are movable via gravity-flow, into a center reactant conduit;
c. introducing a second portion of said reactant stream into the lower extremity of said center reactant conduit, within said lower reaction zone;
d. introducing the resulting mixture of said second reactant stream portion and the reaction product of said first reactant stream portion into a center reactant conduit within the upper of said reaction zones;
e. passing said mixture upwardly through said upper reaction zone and flowing said mixture laterally, in radial flow, through a second annular-form catalyst bed, in which the catalyst particles are movable via gravity-flow, into an outer annular-form void volume; and,
f. withdrawing the resulting converted reactant stream from an upper portion of said second annular-form catalyst bed.

3,918,931
SOLUTION-PRECIPITATION PROCESS FOR MANUFACTURING CUBIC BORON NITRIDE ABRASIVE TOOLS

Robert C. De Vries, Burnt Hills, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,201
Int. Cl.² C04B *31/16*; B24D *3/06*
U.S. Cl. 51—309 **13 Claims**

1. The method of preparing cubic boron nitride abrasive tools comprising the steps of

a. mixing HBN powder with a powdered metallic phase to produce a homogeneous mixture, the atomic content of said metallic phase consisting essentially of aluminum atoms, atoms of a metal selected from the group consisting of chromium and manganese, and atoms of at least one metal selected from the group consisting of iron, cobalt and nickel, the weight per cent of HBN in said mixture, being in the range of from about 10 to about 50 weight percent;

b. pressing said mixture into some predetermined shape;

c. simultaneously subjecting said mixture to an operating temperature and operating pressure within the stability region of CBN defined by the use of the selected metallic phase and thereby forming a melt of the constituents of the metallic phase, the period of time of simultaneous temperature and pressure application being sufficient to permit dissolution of all of the HBN in the metallic phase melt and the precipitation of CBN crystals therefrom;

d. cooling the resulting CBN/alloy system to about room temperature while maintaining the operating pressure;

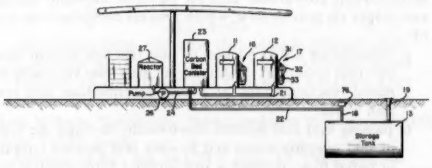
e. reducing the pressure to atmospheric pressure and

f. recovering the preshaped abrasive body consisting essentially of CBN crystals distributed in a transition metal—aluminum alloy matrix.

3,918,932
METHOD AND APPARATUS FOR COLLECTING AND DISPOSING OF FUEL VAPORS

Yuan C. Lee, Newport Beach; Jules M. Kline, Silverado, and Marvin L. Stary, Claremont, all of Calif., assignors to Environics, Inc., Huntington Beach, Calif.

Filed Mar. 6, 1974, Ser. No. 448,719
Int. Cl.² B01D *53/04*
U.S. Cl. 55—62 **17 Claims**



1. A method for preventing hydrocarbon fuel vapors from contaminating the ambient atmosphere while said fuel is being transferred from a first container to a second container having an opening for receiving said fuel from said first container, said first container having fuel outlet means and collection means adapted to fit loosely in said second container opening comprising:

inserting said fuel outlet means and said collection means into said second container opening such that said second container remains open to the ambient atmosphere at said opening during the fuel transfer;

collecting, in said collection means, substantially all of the fuel vapors otherwise escaping from said second container opening while receiving fuel from said outlet means by forming an annular collection zone of low pressure lying about said outlet means and a high pressure zone between said collection zone and said second container opening, the low pressure in said collection zone having a pressure lower than ambient pressure and said high pressure zone to force the fuel vapors from said second container and air from said high pressure zone into said collection zone;

passing said vapors from said collection zone into a temporary storage zone and into intimate contact with an adsorbent substance in said storage zone whereby said vapors are adsorbed on said substance;

removing said adsorbed vapors from said adsorbent substance by passing air into contact with said substance whereby said vapors are removed therefrom forming an air and vapor mixture; and

transferring said air and vapor mixture into an oxidizing chamber containing an oxidizing catalyst and contacting said mixture with said oxidizing catalyst at a temperature sufficient to cause said fuel vapor and air mixture to substantially completely oxidize to form water and carbon dioxide.

10. An apparatus for collecting and disposing of vapors emitted during the dispensing of fuel through a dispenser nozzle, comprising:

vapor collection attachment means for mounting on said dispenser nozzle and forming an annular channel about the exterior of said nozzle, said vapor collection attachment means including means for providing a loose fit of said vapor collection attachment means into a container opening such that said annular channel can communicate with the ambient atmosphere;

means for drawing a partial vacuum in said annular channel to draw into said annular channel air and fuel vapors;

temporary fuel vapor storage means connected to said annular channel and including a vapor adsorbent substance for adsorbing at least a portion of said fuel vapors;

catalytic reactor means for oxidizing an air and fuel vapor mixture into water and carbon dioxide; and

means for directing air through said temporary storage means to desorb said fuel vapor therefrom and form an air and fuel vapor mixture and to transfer said mixture into said reactor means, whereby concentrated fuel vapors are temporarily stored in said storage means and thereafter removed from said storage means in an air and fuel mixture for substantially complete oxidation in said reactor means.

3,918,933
NICKEL-LANTHANUM ALLOY PRODUCED BY A REDUCTION-DIFFUSION PROCESS

Donald L. Martin, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 345,559, March 28, 1973, abandoned. This application July 24, 1974, Ser. No. 491,473
Int. Cl.² B01D *53/16*; C22C *1/05*, *19/08*
U.S. Cl. 55—16 **1 Claim**

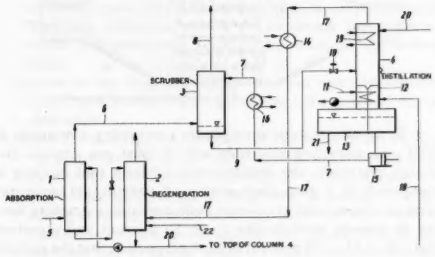
1. In the process for storing hydrogen in particles of nickel-lanthanum alloy ranging in size from about 10 microns to 50 microns by contacting the particles with hydrogen gas which is selectively absorbed by said particles, said alloy consisting essentially of a composition within 15% by weight of the stoichiometric composition of the Ni_5La intermetallic compound, the improvement comprising forming said alloy particles by providing a particulate mixture of lanthanum oxide, calcium hydride and nickel, said calcium hydride being used in an amount in excess of the stoichiometric amount necessary to reduce lanthanum oxide, heating said particulate mixture in a non-reactive atmosphere to decompose said calcium hydride and thereby effect reduction of said lanthanum constituent, then heating the resulting mixture in a non-reactive atmosphere to diffuse the resulting lanthanum metal into said nickel particles to form said alloy, leaving the resulting alloy-containing mixture in an oxidizing or moisture-containing atmosphere to oxidize or hydrolyze the excess calcium precip-

itated therein causing said mixture to disintegrate, and recovering said nickel-lanthanum alloy particles.

3,918,934
PROCESS FOR PURIFYING GASES

Manfred Kriebel, Frankfurt am Main, and Gerhard Hochgesand, Neu-Isenburg, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 22, 1973, Ser. No. 362,988
Claims priority, application Germany, June 3, 1972, 2227071
Int. Cl.² B01D *50/00, 53/14*
U.S. Cl. 55—48 **7 Claims**



1. In a process for purifying gases by scrubbing under pressure with an organic absorbent which is circulated through an absorption stage and a regeneration stage, the improvement which comprises removing absorbent entrained as a vapor and/or mist in the gas leaving the absorption stage by scrubbing with a solvent having a vapor pressure lower by at least one power of 10 than that of the absorbent, and thereafter distilling the solvent-absorbent mixture which results from scrubbing of the gas with said solvent, recovering said absorbent as the overhead product and returning same to the absorbent being circulated through the absorption and regeneration stages, recovering said solvent as the sump product and recycling same to the solvent scrubbing step.

3,918,935
NON-NEWTONIAN LIQUID AND METHOD FOR WET SCRUBBING STACK GASES

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Aug. 13, 1973, Ser. No. 387,818
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B01D *47/06*
U.S. Cl. 55—85 **7 Claims**

1. A process for removing pollutants from a current of gaseous wastes which comprises,

providing a non-Newtonian scrubbing liquid containing water, an alkaline hydroxide or carbonate, and a complexible polymeric material,

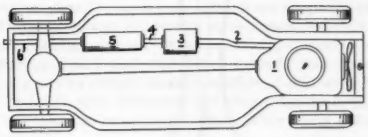
spraying said scrubbing liquid against said current of gaseous wastes at an initial velocity sufficient to form droplets which will penetrate the gaseous current and remove pollutants therefrom, thereby forming a sludge material, and

contacting the sludge material with a bi- or trivalent salt so as to cause said polymeric material to form a complex structure which will entrain the solids content of the sludge but release a substantial portion of water therefrom.

3,918,936
PARTICULATE LEAD TRAP

John G. Holloway, Oakmont, and Herbert W. Barch, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 194,105, Nov. 1, 1971, abandoned. This application July 23, 1974, Ser. No. 490,836
Int. Cl.² B01D *50/00*
U.S. Cl. 55—97 **4 Claims**



1. A method of treating automotive exhaust gases to remove particulate lead therefrom comprising:

passing the gases from an engine and containing lead particulates through an agglomeration zone operating at a temperature between 700°F. and 900°F. and containing therein a fiber glass mat having a resin binder to bind fibers which is capable of withstanding temperatures of 900°F.;

passing all of the gases through said agglomeration zone and said fiber glass mat;

agglomerating lead particulates contained in said gases by impinging said lead particulates upon each other and upon said glass fiber mat;

removing the gases from said agglomeration zone;

providing a filtration zone filled with fiber glass mat having a resin binder to bind fibers capable of withstanding 500°F.;

passing the gases through said mat filtration zone at a temperature of 500°F. or less;

removing particulate lead by filtration in said filtration zone; and

removing from said filtration zone a gas stream of substantially reduced particulate lead content.

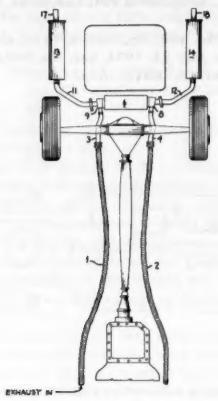
3,918,937
PARTICULATE LEAD TRAP SYSTEM

John G. Holloway, Freeport; Herbert W. Barch, Natrona Heights, both of Pa.; Martin B. Treuhaft, and Charles D. Wood, III, both of San Antonio, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 192,889, Oct. 27, 1971, abandoned. This application May 16, 1973, Ser. No. 360,730
Int. Cl.² B01D *50/00*
U.S. Cl. 55—97 **4 Claims**

1. In the method of treating high temperature exhaust gases emanating from an internal combustion engine to remove particulates therefrom the process comprising passing said gases from the engine to a cyclone separator by means of a closed conduit, reducing the temperature of said high temperature exhaust gases to 600°F. or below after emanation from said engine and before passing the gases into said cyclone separator, separating by inertia 75 percent of the particles in said exhaust gases greater than about 2 microns in size in said cyclone separator, reducing the resultant exhaust gas stream temperature to 500°F. or less to insure that any lead particulate present therein will be in a state to be readily filtered, filtering said gas stream to remove particulates remaining in said stream by passing all of said gases through a fiber glass paper filter containing an organic resin binder on said fiber

glass rendering said fiber glass paper thermally stable at 500°F. and removing 99.97 percent of the particulates in said



gas stream below 0.3 micron in size on said fiber glass paper and exhausting the resulting gases from said filter.

3,918,938

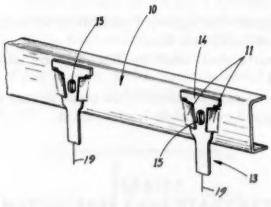
ELECTRODE SUPPORT APPARATUS FOR ELECTRICAL PRECIPITATORS

Richard L. Kline, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Division of Ser. No. 238,247, March 27, 1972, Pat. No. 3,835,623. This application June 12, 1974, Ser. No. 478,529

Int. Cl.² B03C *3/41*

U.S. Cl. 55—148 **4 Claims**



1. In an electrostatic precipitator the improvement comprising a discharge electrode construction and support means therefor comprising:

an electrode support apparatus;

a current carrying support means having a vertical wall and a plurality of hanger engaging tabs punched outwardly therefrom, the tabs being arranged in sets, each set including two sets lying in intersecting planes and projecting from the same side of said support means wherein each tab of each set of tabs opens toward the other of the same set, the two tabs being divergent upwardly to each other;

said tabs defining electrode hanger receiving slots one slot located between each of said tabs and said support means, said electrode hanger receiving slots being generally V-shaped in cross-section;

a self-aligning electrode hanger having a discharge electrode attached thereto and having tab engaging edges which are removably received in said electrode hanger receiving slots of a set of tabs, said self-aligning electrode hanger being tapered to fit between a set of tabs with its edges removably engaging said tabs.

3,918,939

ELECTROSTATIC PRECIPITATOR COMPOSED OF SYNTHETIC RESIN MATERIAL

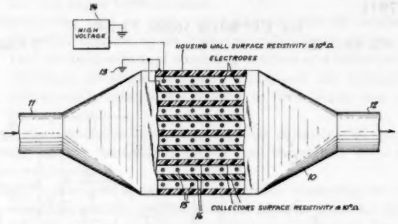
Lothar Hardt, Eschborn, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 3, 1974, Ser. No. 502,777

Claims priority, application Germany, Aug. 31, 1973, 2343900

Int. Cl.² B03C *3/45*

U.S. Cl. 55—155 **3 Claims**



1. In an electrostatic precipitator comprising a housing, at least one collecting electrode and at least one corona discharge electrode, the improvement wherein said housing is composed of a glass-fiber-reinforced unsaturated polyester resin or unsaturated vinyl ester resin containing graphite having an average particle size up to 50 microns and a carbon content of 95 to 99 percent in such proportion that the surface resistance of the housing is $\leq 10^8\Omega$, said collecting electrode being composed of a glass-fiber-reinforced unsaturated polyester resin or unsaturated vinyl ester resin containing graphite having an average particle size up to 50 microns and a carbon content of 95 to 99 percent in such proportion that the surface resistance of the collecting electrode is $\leq 10^4\Omega$.

3,918,940

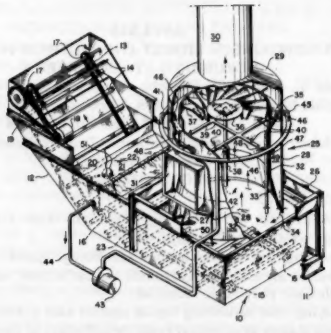
COMBINED WET SCRUBBER-CLARIFIER UNIT

Robert A. Westlake, 4212 228th St. Southeast, Bothell, Wash. 98011, and Frederick W. Thiele, 18542 Springdale Court Northwest, Seattle, Wash. 98177

Filed Feb. 4, 1974, Ser. No. 439,440

Int. Cl.² B01D *47/06*

U.S. Cl. 55—223 **4 Claims**



1. A scrubbing apparatus for removing entrained particulate solids from a gas stream wherein the scrubber unit includes as an integral part thereof a slurry deconcentration and sludge removal means sealed from contact with the ambient atmosphere, comprising

a sludge-clarification tank holding a predetermined amount of water defining a pool having means therein to remove settled sludge therefrom,

a wet scrubber unit mounted on the tank having (1) an outer peripheral wall having an inlet with its bottom edge projecting below the level of water in the tank, (2) an inner peripheral wall spaced from the outer wall having its bottom edge terminating above the water level in the tank and having the outer and inner walls spaced near their bottom edges to form venturi section means for impinging a particulate-laden gas stream into the pool of water held in the tank, said inner peripheral wall defining an inner tubular chamber in the unit through which the partially cleaned and moisture-laden gases exit after passage through the pool of water, (3) a de-mister unit including vanes mounted in the chamber to impart a swirling motion to the exiting gases to centrifugally separate residual particulate solids and entrained water droplets from the gas stream, (4) means extending from the chamber to the outer wall for collecting the water and particulate solids removed from the gases on passage through the de-mister unit, and (5) drain means in communication with the collection means for returning the collected water and particulate solids to the water in the settling tank,

a cover on the tank sealing the scrubber unit and contents of the tank from the ambient atmospheric pressure during operation,

means for reducing the tendency of the vanes of the de-mister unit to coat with particulate solids and reducing plugging of the drain means returning the collected water and particulate solids to the settling tank, including (1) a first series of spray nozzles mounted adjacent the vanes to continuously spray water against the vanes of the de-mister, and (2) a second series of spray nozzles mounted adjacent each of the drains to spray water thereinto, and (3) means connected to the nozzles supplying water to the nozzles, and

means maintaining the water level in the settling tank between predetermined limits during operation of the unit for effecting efficient scrubbing capacity of the unit.

3,918,941

MIST ELIMINATOR GAS FLOW DEFLECTOR

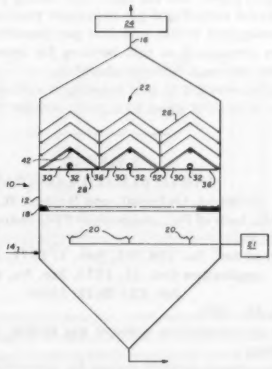
George William Fallon, III, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1974, Ser. No. 430,106

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B01D *47/00*

U.S. Cl. 55—230 **8 Claims**



1. In a mist eliminator comprising a plurality of spaced plates between which upwardly flowing gases are adapted to pass and presenting inclined surfaces on which solid particles carried by the gas accumulate, means for dislodging said accumulated particles comprising an elongated wash lance, underlying said plates, having at least one spray nozzle therein for discharging a stream of water at high pressure directed toward said inclined surfaces, means for moving said wash lance backwardly and forwardly with respect to said plates so that the discharged water impinges substantially the entire surface of said plates, means for deflecting the gas flow from the region of said plates at which said stream of water is directed, said deflecting means comprising a generally U-shaped deflector having a bottom plate underlying said wash lance and two side plates extending upward from opposing sides of said bottom plate in planes transverse to the longitudinal axis of said wash lance and on opposite sides of each of said at least one spray nozzle, said side plates containing opposing openings through which said wash lance extends, said openings being of a size to permit relative rotation of said wash lance with respect to said deflector, and means for causing said deflecting means to move backwardly and forwardly with said wash lance.

3,918,942

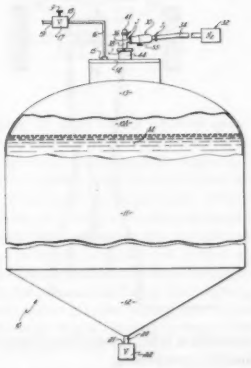
ASEPTIC STORAGE SYSTEM FOR BULK MATERIALS AND IMPROVED MICROBIOLOGICAL FILTER THEREFOR

Steve A. Rechtsteiner, Cincinnati, Ohio; Philip E. Nelson, West Lafayette, Ind., and Marinus deBonte, Mississanga, Canada, assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 3, 1974, Ser. No. 466,672

Int. Cl.² B01D *31/00*

U.S. Cl. 55—385 **6 Claims**



1. Apparatus for aseptically storing bulk material comprising:

an aseptic tank into the interior of which sterile bulk material is placed for storage, said tank having a port therein communicating with said tank interior through which pressurized microbiologically filtered gas is admitted, and a gas filtering assembly interconnecting said tank port and a source of unsterilized pressurized gas, said filtering assembly including:

a. an elongated tubular housing having walls which define an elongated cavity and oppositely disposed gas inlet and outlet ports in communication with said cavity, said inlet gas port being connectable to a source of unsterilized pressurized gas and said outlet gas port being connected to said tank port, said housing having a condensate drain formed in the wall thereof which is

disposed in the bottom region of the housing to permit gravity flow therefrom of nonaseptic condensate which collects in the bottom of the housing cavity, and

b. an elongated tubular gas pervious micro-biological filtering element disposed within said housing cavity and having an open end connected to said gas outlet port of said housing, an intermediate gas pervious tubular microbiological filtering section spaced from said housing wall to establish therewith an elongated annular gas flow path, and a closed end disposed remote from said open end, whereby said sterile tank interior is isolated from said housing cavity by said filter element such that the only gas flow path existing between said gas inlet and said tank interior is through said filter element, said filter element being disposed in inclined relation to the horizontal with the open end thereof lowermost to promote gravity flow into said tank interior of sterile condensate forming within said intermediate tubular filter section.

3,918,943

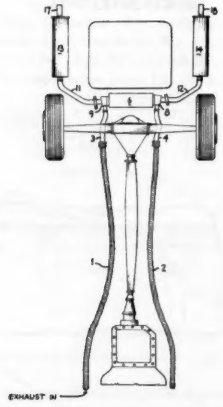
PARTICULATE LEAD TRAP SYSTEM

John G. Holloway, Freeport; Herbert W. Barch, Natrona Heights, both of Pa.; Martin B. Treuhaft, and Charles D. Wood, III, both of San Antonio, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 192,889, Oct. 27, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,752

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—337 **2 Claims**



1. In a particulate filter system for automotive exhaust gases the combination comprising:

a first exhaust gas conduit, one end thereof being in gas communication with an internal combustion engine;

an inertial gas cyclone separator having an inlet and an outlet, the inlet thereof being in gas communication with the opposite end of said first exhaust gas conduit;

a second exhaust conduit, one end thereof being in gas communication with the outlet of said inertial gas separator;

a filter in gas communication with the opposite end of said second exhaust conduit, said filter being comprised of:

a filter housing;

an inlet means to said filter housing allowing the exhaust gases to be introduced into said filter housing;

an outlet means allowing the gases introduced into said housing to be discarded for disposal;

a pleated fiberglass paper filter interposed between said inlet and said outlet across the flow path in a manner that all gases passing from the inlet to the outlet must pass through said fiberglass paper filter; said fiberglass paper filter having thereon a polyimide binder capable of withstanding 500°F; said binder maintaining said fiberglass paper filter in paper form, and said fiberglass paper filter removing at least 99.97 percent of all particulates of 0.3 microns and greater in said exhaust gases which have entered said filter housing.

3,918,944

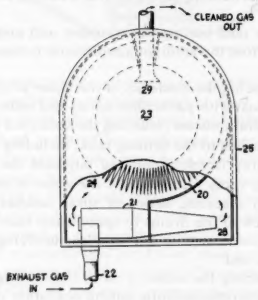
LEAD TRAP

Martin B. Treuhaft, and Charles D. Wood, III, both of San Antonio, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 192,846, Oct. 27, 1971. This application July 16, 1974, Ser. No. 489,951

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—337 **4 Claims**



1. In an exhaust gas filter device for automotive exhaust gases the combination comprising:

an exhaust gas conduit means,

a housing in gas communication with said exhaust gas conduit means,

a pleated fiber glass paper barrier having a binder which binds fibers to each other thereon capable of withstanding 500°F., said fiber glass paper barrier being of annular configuration and positioned within said housing to provide a first gas chamber defined by the outer surface of said glass fiber paper barrier and the inside wall of said housing and a second gas chamber defined by the inside of said paper and the floor and ceiling of said housing;

an inertial centrifugal gas separator positioned within said housing and within said first gas chamber,

means connected to said housing for introducing exhaust gases into said first gas chamber,

means connected to said housing in said second gas chamber to remove gases to a point outside of said housing.

3,918,945

PARTICULATE LEAD TRAP

John G. Holloway, Oakmont, and Herbert W. Barch, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 194,105, Nov. 1, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,489

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—350 **1 Claim**

1. In an automotive exhaust gas system the combination comprising:

a first exhaust conduit means for conveying exhaust gases from an internal combustion engine;

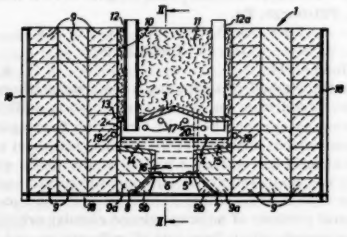
an agglomerator in gas communication with said exhaust conduit means; said agglomerator comprised of:

a housing;
an inlet to said housing in gas communication with said first exhaust conduit means;
an outlet from said housing to convey gases therefrom;
a rigid support member within said housing in gas communication and integral with said inlet, said rigid support member having apertures therein for passing gases through said inlet and through said support member;
a glass fiber mat disposed about and in contact with said rigid support member to agglomerate particulates from said exhaust gases, said glass fiber mat having thereon a binder capable of withstanding 900°F.;
a porous rigid sleeve disposed about said glass fiber mat to provide support to said glass fiber mat and spaced apart from said housing to provide a gas distribution zone between said glass fiber mat and the interior of said housing; said agglomerator constructed to agglomerate the particulates in said exhaust gases;
a second exhaust gas conduit means, one end thereof being in gas communication with the outlet of said agglomerator;
a filter in gas communication with the opposite end of said second exhaust conduit means, said filter comprises of:
a housing;
an inlet to said housing in gas communication with said second exhaust conduit means at one end opposite said agglomerator;
an outlet from said housing to convey gases therefrom;
a rigid support member within said housing in gas communication and integral with said inlet, said rigid support member having apertures therein for passing gases through said inlet and through said support member;
a glass fiber mat disposed about and in contact with said rigid support member to filter particulates from said exhaust gases, said glass fiber mat having thereon a binder capable of withstanding 500°F;
a porous rigid sleeve disposed about said glass fiber mat spaced apart from said housing to provide a gas distribution zone on the interior of said housing;
said filter being constructed to remove particulates in said exhaust gases.

3,918,946
GLASS-SPINNING APPARATUS

Francis Ferdinand Jaray, Martley, England, assignor to Glass Fibres and Equipment Limited, Worcestershire, England

Filed Jan. 22, 1974, Ser. No. 435,423
Claims priority, application United Kingdom, Feb. 1, 1973, 5009/73; Feb. 3, 1973, 5480/73
Int. Cl. C03b *37/02*
U.S. Cl. 65—1 **23 Claims**

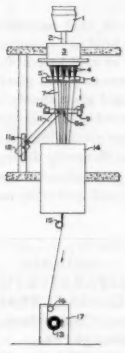


1. A glass-spinning apparatus, particularly for spinning glass fibers, comprising a vessel adapted to contain glass material and having an open bottom portion; a perforated bottom plate abutting said open bottom portion and defining an unsealed juncture therewith; heating means for heating the glass material contained in said vessel to a molten state so that the molten glass flows through the perforations in said bottom plate and thereupon solidifies to form a bundle of glass fibers; and heat-insulating means permeable to molten glass and surrounding said juncture and having an outwardly facing surface, said heat-insulating means receiving the molten glass escaping from said vessel through said juncture and being dimensioned so that the molten glass which permeates said insulating means solidifies therein in a region remote from said juncture and also spaced from said outwardly facing surface.

3,918,947
METHOD OF CONTROLLING GLASS FIBER FORMING OPERATION

John Maaghul, Monroeville, and David H. Griffiths, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 7, 1975, Ser. No. 539,215
Int. Cl.² C03B *37/02*; **C03C** *25/02*
U.S. Cl. 65—3 **6 Claims**



1. In the coating of glass fibers wherein glass fibers are drawn at high speeds from a molten glass source, coated while being drawn at high speed and passed through a high temperature drying zone to remove moisture therefrom after coating and wherein the fibers have been gathered prior to their admission to the drying zone into a plurality of small strands, the improvement comprising gathering the said plurality of small glass strands into a single consolidated strand after coating and passing the single consolidated strand through said drying zone when the speed of said individual strands passed through said drying zone is below a value during coating which would damage said individual strands during drying, to thereby prevent damage to said individual strands.

3,918,948
METHOD OF MAINTAINING PAIRED GLASS SHEETS IN ALIGNMENT DURING BENDING

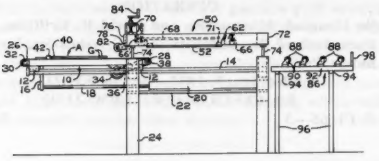
Tulio J. Monzi, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 19, 1974, Ser. No. 490,163
Int. Cl.² C03B *23/02*
U.S. Cl. 65—25 R **6 Claims**

1. In a method of fabricating curved glass windshields comprising a pair of glass sheets of matching curvature, wherein said pair of glass sheets is assembled in aligned stacked relation with one sheet of said pair forming the upper sheet of said assembly and the other sheet of said pair forming the lower sheet of said assembly, said sheets are mounted in said assembled relation on a bending mold, and said mold moved into an enclosed hot atmosphere where said glass sheets are subjected to an elevated temperature sufficient to soften said glass

sheets so that they conform to the shape of the mold and to one another so that said glass sheets are capable of lamination to one another without breakage, wherein said mold with said glass sheets mounted thereon is moved at a speed that changes sufficiently to tend to cause the upper glass sheet of said pair to slide out of alignment with said lower glass sheet,

the improvement comprising assembling said glass sheets in the flat condition in aligned relation to one another, supporting the assembly so formed beneath pressure applying means, providing relative motion between said assembly and said pressure applying means across an



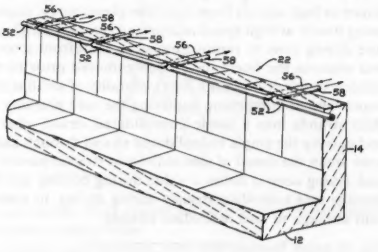
entire dimension of said assembly while said pressure applying means is held in pressurized engagement against the upper surface of said assembly to force out sufficient fluid entrapped between said glass sheets to increase the friction between said glass sheets of said assembly before mounting said assembly on said bending mold so that said sliding of said upper glass sheet relative to said lower glass sheet is reduced sufficiently during said mold movement to maintain said glass sheets in approximate alignment during passage of said assembly laden mold through said hot atmosphere.

3,918,949

METHOD AND APPARATUS FOR PREVENTING EROSION OF A GLASS FURNACE BASIN WALL

Ronald L. Schwenninger, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 10, 1974, Ser. No. 487,324
Int. Cl.² C03B 5/22
U.S. Cl. 65—26 **6 Claims**



1. A method of reducing the erosion of the side walls of the melting section of a glass melting furnace comprising a basin defined by a floor, side walls and front and back walls wherein glass making ingredients are melted to form a mass of molten glass which flows in said basin along the side walls thereof toward the back wall, said mass of molten glass having a surface which forms a flowing molten glass line near the top of said side walls, comprising

conducting a cooling fluid medium in heat transferring relation to said molten glass through a region horizontally disposed throughout its entire length in said basin closely adjacent to and near the top of a side wall thereof and at a location at which erosion of the side walls normally occurs, and along inlet and outlet paths at each end of said region which are horizontally disposed and extend laterally through said adjacent basin side wall to provide an inlet and an outlet for the cooling fluid medium conducted through said region, said region and said laterally extending fluid inlet and outlet paths associated with said region each being entirely submerged in the mass of molten glass flowing in said basin and disposed a short distance below the glass line of said flowing mass of molten glass, and

conducting said cooling fluid medium through said region and said inlet and outlet paths in an amount sufficient to build up a thick protective layer of devitrified glass around said region which extends from a location below said region to a location thereabove which is near the glass line of said flowing mass of molten glass and to provide thin, slow moving layers of highly viscous molten glass around said layer of devitrified glass which extend to the glass line of said flowing mass of molten glass.

4. In a glass melting furnace having a melting section comprising a basin defined by a floor, side walls and front and back walls wherein glass making ingredients are melted to form a mass of molten glass which flows in said basin along the side walls thereof toward the back wall, said mass of molten glass having a surface which forms a flowing molten glass line near the top of said side walls,

at least one fluid-conducting pipe means horizontally disposed throughout its entire length in said basin closely adjacent to and near the top of a side wall thereof and at a location at which erosion of the side wall normally occurs, each said fluid-conducting pipe means being provided at each end thereof with horizontally disposed portions extending laterally through said adjacent basin side wall to provide an inlet and an outlet for fluid conducted by said fluid-conducting pipe means, said fluid-conducting pipe means and said laterally extending fluid inlet and outlet portions thereof each being entirely submerged in the mass of molten glass flowing in said basin and disposed a short distance below the glass line of said flowing mass of molten glass, and

means for passing a fluid-cooling medium through said fluid-conducting pipe means and said inlet and outlet portions thereof in an amount sufficient to build up a thick protective layer of devitrified glass around said fluid-conducting pipe means which extends from a location below said pipe means to a location thereabove which is near the glass line of said flowing mass of molten glass and to provide thin, slow moving layers of highly viscous molten glass around said layer of devitrified glass which extend to the glass line of said flowing mass of molten glass.

3,918,950

GLASS SHEET TEMPERING

George W. Stilley, Plantation, Fla., assignor to PPG Industries, Inc., Pittsburgh, Pa.

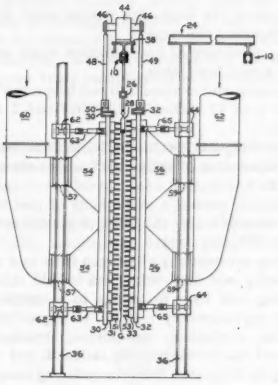
Filed Dec. 3, 1974, Ser. No. 529,188
Int. Cl.² C03B 27/00
U.S. Cl. 65—114 **8 Claims**

1. In the method of tempering a glass sheet wherein said sheet is cooled from an elevated temperature sufficient for tempering by applying blasts of tempering fluid against the opposite surfaces of the sheet to cool the glass sheet at a rate sufficient to impart at least a partial temper to the glass and moving said blasts relative to said opposite surfaces in closed circular orbital paths whose peripheral portions overlap the peripheral portions of adjacent closed circular orbital paths, and applying the blasts from sets of uniformly spaced moving nozzles in such a manner that the central portion of each blast arriving at the glass sheet surface is relatively strong while its peripheral portion is relatively weak,

the improvement comprising applying said blasts against the opposite glass sheet surfaces in such a manner that the center of the closed circular orbit of movement of each blast applied against one glass sheet surface is linearly offset from the center of the closed circular orbit of

movement of the corresponding blast applied against the opposite glass sheet surface by a constant distance equal to a small proportion of the diameter of said orbits and the positions simultaneously occupied by corresponding blasts of opposite sets applying said blasts to the opposite surfaces of said glass sheet is 180° out of phase with one another to cause the distance between the centers of corresponding blasts from said sets against the opposite glass sheet surfaces measured along the plane of the glass sheet to vary cyclically during each orbit to produce a tempered glass sheet having an iridescent pattern that is difficult to detect with the naked eye.

4. Apparatus for tempering a glass sheet comprising means for supporting said sheet in a given position in a given plane, a first set of nozzles spaced to one side of said position with the openings for said nozzles arranged in a plane parallel to said given plane, means to apply blasts of tempering fluid through said first set of nozzles in one direction toward said position,



a second set of nozzles spaced to the other side of said position with the openings for said second set of nozzles arranged in a plane parallel to said given plane, means to apply blasts of tempering fluid through said second set of nozzles in a direction opposite said one direction toward said position,

means to move each nozzle of each set in a circular orbital path so that its nozzle opening moves in a plane for its set parallel to and spaced from said given plane,

spacer means to support one set of nozzles in offset relation to said other set of nozzles,

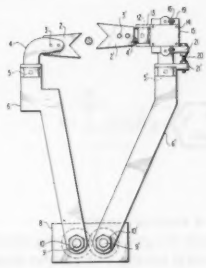
eccentric means to impart closed circular orbital movement to each of said sets of nozzles in such a manner that each nozzle of one of said sets simultaneously occupies a position 180° out of phase with the position occupied by a corresponding nozzle of the other of said sets during said closed circular orbital movement, and

means for supporting a glass sheet in said given position between said sets of nozzles for application of said blasts from said sets of nozzles so arranged and so moved.

3,918,951
APPARATUS FOR SHEARING FLOWING MOLTEN GLASS

Teruki Kitayama, Akishima; Hiroaki Takahara, Tachikawa, and Hiroshi Ogawa, Hachioji, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed May 15, 1974, Ser. No. 469,974
Claims priority, application Japan, May 15, 1973, 48-53811
Int. Cl.² C03B *5/38*
U.S. Cl. 65—334 **5 Claims**



1. In an apparatus for shearing flowing molten glass including a pair of oppositely oriented chelae-like V-shaped blades confronting each other and attached to rotatable arms and means for rotating said arms such that said blades rotate in closely adjacent planes but in opposite directions with respect to each other, the improvement wherein:

said blades are fixed to said arms so as to rotate at mutually different radii such that the intersection of the blade edge portion for each blade do not meet during rotation to closed nip position.

3,918,952
HIGH ANALYSIS CLEAR LAWN FERTILIZER SOLUTION

Phillip J. Neumiller, Racine, Wis., assignor to I. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 15, 1974, Ser. No. 451,613
Int. Cl.² C05C *9/00*; **C05B** *15/00*, *7/00*
U.S. Cl. 71—28 **9 Claims**

1. A substantially clear liquid fertilizing composition having a high percentage of available nitrogen consisting essentially of:

KCl	1 to 7 percent
Urea	15 to 42 percent
Surfactant	0.3 to 5 percent
Ammoniated polyphosphate	10 to 30 percent
Lower monohydric alcohol	2 to 15 percent
NH_4OH	0.25 to 2 percent
Chelating agent	0 to 1.0 percent
H_2O	30 to 55 percent.

said surfactant being selected from sodium, potassium or ammonium alkyl sulfates having from 12 to 20 carbon atoms and mixtures of said sulfates with at least one additional anionic surfactant selected from N-alkyl sarcosinic acid, sulfosuccinic acid derivative or mixtures, wherein said alcohol is selected from methanol, ethanol, normal propanol and normal butanol and said chelating agent is selected from ethylene diamine tetracetic acid disodium salt and ethylene diamine tetracetic acid tri-potassium salt, and said composition having a pH within the range of from 7.5 to 8.7.

3,918,953
SUBSTITUTED BENZYL-THIOLCARBAMIC ACID ESTERS AS HERBICIDES

Akio Kudamatsu; Masao Miyamoto, and Nobuo Fukazawa, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

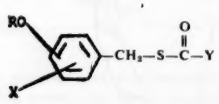
Division of Ser. No. 188,431, Oct. 12, 1971, Pat. No. 3,863,474, which is a division of Ser. No. 875,546, Nov. 10, 1969, abandoned. This application Feb. 21, 1974, Ser. No. 444,602

Claims priority, application Japan, Nov. 12, 1968, 43-82249

Int. Cl.² A01N 9/22

U.S. Cl. 71—94 **4 Claims**

1. Method of combating unwanted vegetation which comprises applying a herbicidally effective amount of compound of the formula



in which

R is alkyl of 1–4 carbon atoms,

X is selected from the group consisting of hydrogen, chloro, bromo, and alkyl having 1–4 carbon atoms, and

Y is selected from the group consisting of pyrrolidino and piperidino, alone or in admixture

with a solid or liquid diluent or carrier.

3,918,954
HERBICIDAL COMPOSITIONS CONTAINING HALOMETHYL KETONES AND METHOD OF USE THEREOF

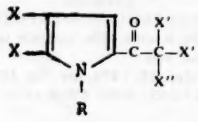
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,086

Int. Cl.² A01N 9/22

U.S. Cl. 71—95 **12 Claims**

1. A post-emergence herbicidal composition consisting essentially of an effective herbicidal amount of (A) a compound as the active ingredient having the formula:



wherein each X is chlorine, bromine or iodine, both values of X being identical; X′ is chlorine or fluorine, both values of X′ being identical; X″ is either hydrogen or halogen identical with X′; and R is hydrogen, together with (B) a conventional inert carrier especially adapting the composition as a whole to application to areas to be cleared of undesirable plant growth.

3,918,955
METAL POWDERS

David Myers Llewelyn, Sarnhelen, Wales, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed May 6, 1974, Ser. No. 467,127

Claims priority, application United Kingdom, May 15, 1973, 22961/73

Int. Cl.² B22F 9/00

U.S. Cl. 75—.5 AA **10 Claims**

1. In a process for the production of B type nickel powder by the thermal decomposition of nickel carbonyl in a decomposer with or without the presence of a diluent gas, wherein the rate of input of nickel carbonyl, the amount of any diluent gas introduced and the decomposition temperature are controlled in correlation to provide that fluffy nickel powder is not deposited on the heated walls of the decomposer, the improvement comprising: recovering separately the fine nickel powder suspended in exit gases leaving the decomposer and maintaining the recovered fine nickel powder and the B type nickel powder that settles at the bottom of the decomposer separate from each other, and thereby providing a B powder product characterized by a bulk density less than one gram per millilitre while avoiding deposition of fluffy nickel on the decomposer walls and in addition providing a fine nickel powder product characterized by a Fisher particle size less than the Fisher particle size of said B powder product and a bulk density greater than the bulk density of said B powder product.

3,918,956
REDUCTION METHOD

Jesse J. Baum, 10419 Kelso Drive, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 591,997, Nov. 4, 1966, abandoned. This application July 13, 1970, Ser. No. 54,427

Int. Cl. C21b 1/08, 1/28, 1/14

U.S. Cl. 75—3 **9 Claims**

1. A process for producing molten metal for casting purposes comprising the steps of,

forming a mixture of finely divided metal ore concentrate with a coal base pitch,

compressing said mixture into soft briquettes ranging in size from 2 to 12 inches in diameter and 2 to 8 inches in height,

thermosetting said soft briquettes to form hard briquettes at a temperature ranging from approximately 350°F. to 550°F.

continuously passing a multiplicity of said hard briquettes downwardly under the force of gravity through an elongated reducing zone,

excluding substantially all oxygen from said reducing zone, reducing said hard briquettes in said reducing zone by heating said hard briquettes to a temperature ranging from approximately 1,900°F. to approximately 2,200°F. so that a relatively non-porous, shrunken briquette is formed that is substantially reduced, and

passing the briquettes from the reducing zone into a melting zone to produce a supply of molten metal, thereby conserving the residual heat in the briquettes from the reducing zone.

3,918,957
METHOD OF MAKING IRON-COPPER ALLOY

Kenzo Suzuki; Toshio Mizobuchi, and Makoto Kase, all of Kumagaya, Japan, assignors to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,405

Claims priority, application Japan, Aug. 17, 1972, 47-81814

Int. Cl.² C22B 4/06; C22C 38/16

U.S. Cl. 75—10 R **4 Claims**

1. A method of making iron-copper alloys having finely and uniformly dispersed phase structure comprising the steps of forming a consumable electrode composed of a number of iron and copper wires positioned lengthwise in an iron or copper pipe, compacting the electrode by pressing it, the carbon content of said electrode being limited to less than 0.02 percent by weight, progressively melting the bottom end of said electrode by submerging it in a molten slag containing at least one metal fluoride, and cooling the molten mass of metal formed from the consumable electrode.

3,918,958

METHOD FOR THE PRODUCTION OF SPONGE IRON

Guenter Heitmann, Hedwigstr. 47, Essen, Germany

Continuation-in-part of Ser. No. 835,390, June 23, 1969, abandoned. This application July 25, 1972, Ser. No. 274,971

Claims priority, application Austria, June 24, 1968, 6016/68

Int. Cl. C21c 5/52

U.S. Cl. 75—13 17 Claims

1. A method of producing sponge iron by the direct reduction of oxide-containing iron ore comprising the steps of introducing the oxide-containing iron ore into an enclosed heating space, conveying the ore through the space and, as the ore is being conveyed, preheating the ore to reduction temperature by flowing a hot gas in different directions, in relationship to the passage of the ore through the enclosed heating space, maintaining a neutral to oxidizing atmosphere within the heating space, separating the gas used for preheating from the preheated ore and introducing the preheated ore directly from the enclosed heating space into one end of an elongated rotatable reduction chamber, rotating the reduction chamber while passing the ore through the chamber in its elongated direction to the opposite end thereof, blowing a carbonaceous reducing agent by means of compressed air into the reduction chamber from the same end as the preheated ore is introduced and in cocurrent direction with ore and furnace gases in an amount sufficient for the reduction of the ore and reducing the ore within the reduction chamber, adding fresh air at spaced locations along the elongated direction of the chamber, and removing the ore reduced to sponge iron from the opposite end of the reduction chamber, the sources of the hot gas and the furnace gases being independent of one another.

3,918,959

PROCESS FOR PRODUCTION OF MAGNESIUM

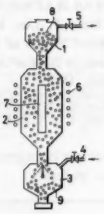
Tomoo Matsushima, and Tsutou Odajima, both of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,175

Claims priority, application Japan, Dec. 28, 1973, 48-144648

Int. Cl.[2] C22B 45/00

U.S. Cl. 75—67 R 7 Claims



1. In a process for obtaining metallic magnesium from a mixture of magnesium oxide with calcium oxide as the raw material by reducing said mixture at an elevated temperature to give rise to magnesium vapor and cooling said magnesium vapor, the improvement which comprises two stages, the first stage of adding at least one member selected from the group consisting of silicon and ferrosilicon to said mixture consisting of magnesium oxide and calcium oxide, blending and shaping the resultant mixture in the form of briquets, and heating said briquets in an inert atmosphere under temperature and pressure conditions capable of substantially inhibiting the formation of magnesium vapor, said temperature being not lower than the melting point of calcium-silicon alloy and thereby giving rise to calcium-silicon alloy within said briquets and the second stage of heating, in a heating furnace, the briquets having calcium-silicon alloy formed therein for thereby reducing the magnesium oxide present in said briquets into metallic magnesium.

3,918,960

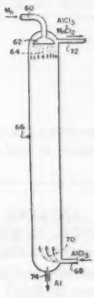
METHOD FOR THE PRODUCTION OF ALUMINUM

Charles Toth, Westwego, La., assignor to Applied Aluminum Research Corporation, Westwego, La.

Continuation of Ser. No. 861,981, Sept. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 692,036, Dec. 20, 1967, Pat. No. 3,615,359. This application July 21, 1972, Ser. No. 273,700

Int. Cl. C22b 21/02

U.S. Cl. 75—68 B 18 Claims



1. A process for the continuous production of aluminum comprising the steps of: introducing gaseous aluminum trichloride at a bottom portion of a reaction chamber; providing manganese as liquid in an upper portion of said reaction chamber; allowing said gaseous aluminum trichloride to rise and said liquid manganese to flow downwardly in said reaction chamber thereby providing counter-current flow contact between said aluminum trichloride and said manganese within said reaction chamber; maintaining at least a portion of said reaction chamber at a temperature sufficient to react the aluminum trichloride with the manganese to yield liquid aluminum and gaseous manganese chloride, reacting said aluminum trichloride gas with said liquid manganese to form substantially manganese-free aluminum, and recovering said substantially manganese-free aluminum from said reaction chamber.

3,918,961

METHOD OF REMOVING BULK SODIUM FROM METALLIC SURFACES

Hector P. Maffei, Richland, and Ronald R. Borisch, Kennewick, both of Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

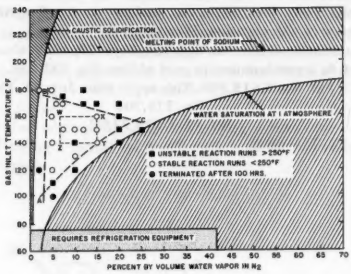
Filed Dec. 12, 1974, Ser. No. 532,138

Int. Cl.[2] C22B 27/00

U.S. Cl. 75—97 A 10 Claims

1. A process of removing sodium from an article within an enclosed space which comprises introducing into said en-

closed space a mixture of water vapor and another gas at a gas inlet temperature and composition falling within the area ABC


CAUSTIC SOLIDIFICATION
MELTING POINT OF SODIUM
WATER SATURATION AT 1 ATMOSPHERE
UNSTABLE REACTION RUNS >250°F
STABLE REACTION RUNS <250°F
TERMINATED AFTER 100 HRS.
REQUIRES REFRIGERATION EQUIPMENT
GAS INLET TEMPERATURE °F
PERCENT BY VOLUME WATER VAPOR IN N2

of FIG. 1 of the accompanying drawing, said other gas being one which is inert to sodium at said temperature.

3,918,962

PROCESS FOR WINNING COPPER USING CARBON MONOXIDE

Michael Dubeck, Birmingham, and Suk Joong Im, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 267,241, June 28, 1972, Pat. No. 3,855,384. This application Oct. 4, 1974, Ser. No. 512,331

Int. Cl.² C22B *15/12*

U.S. Cl. 75—117 **12 Claims**

1. A process for recovering copper metal from an acidic solution containing copper ions, iron ions and chloride ions which comprises

1. treating said solution with a carbon monoxide containing gas at elevated temperatures and pressures for a time sufficient to form a copper-containing complex as a precipitate,
2. separating said precipitated complex from said solution,
3. heating said precipitated complex to obtain copper chloride, and
4. reducing said copper chloride, whereby copper metal of high purity is obtained.

3,918,963

ADDITION AGENT FOR MOLTEN METALS AND PROCESS FOR MAKING THE SAME

Luigi Palumbo, via Eusebio Chini 22, and Raffaele Tarozzi, via Marangoni N. 1, both of Rome, Italy

Filed June 20, 1974, Ser. No. 481,546

Claims priority, application Italy, June 20, 1973, 50929/73

Int. Cl.² C22C *33/08*; B01J *23/02*; C09C *1/56*

U.S. Cl. 75—130 **7 Claims**

1. An addition agent for the inoculation of a molten metal bath, consisting essentially of 5 to 50 percent by weight of a metal selected from the group consisting of alkali metal and alkaline earth metal having a particle size 0.1 to 3 mm., 50 to 80 percent by weight of a porous material having a particle size of 0.1 to 3 mm., said porous material being selected from the group consisting of semi-coke, coke and graphite, and 10 to 25 percent by weight of a binder which secures said metal particles and said porous material particles together in a briquette.

3,918,964

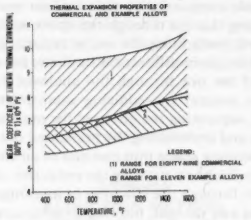
NICKEL-BASE ALLOYS HAVING A LOW COEFFICIENT OF THERMAL EXPANSION

James French Baldwin, Delray Beach, and Douglas H. Maxwell, North Palm Beach, both of Fla., assignors to Sorcery Metals, Inc., Delray Beach, Fla.

Filed Dec. 21, 1973, Ser. No. 427,311

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **14 Claims**


THERMAL EXPANSION PROPERTIES OF COMMERCIAL AND EXAMPLE ALLOYS
LEGEND:
(1) RANGE FOR EIGHTY-NINE COMMERCIAL ALLOYS
(2) RANGE FOR ELEVEN EXAMPLE ALLOYS
TEMPERATURE, °F

1. A nickel base alloy having elevated temperature strength, resistance to oxidation and hot corrosion, and a low coefficient of thermal expansion, consisting essentially of the following elements in the weight percent ranges set forth:

ELEMENTS	PERCENT
Chromium	24–42
Molybdenum	8–22
Carbon	0.15–1.2
Boron	0.04–0.7 [0–0.8]

the balance of the alloy being essentially nickel and minor amounts of impurities and incidental elements which do not detrimentally affect the basic characteristics of the alloy, the carbon and boron being effective to prevent the formation of deleterious embrittling phases through formation of chromium and molybdenum borides and carbides.

3,918,965

IRIDIUM-HAFNIUM ALLOY

Henry Inouye, and Chain T. Liu, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 26, 1974, Ser. No. 464,429

Int. Cl.² C22C *5/04*

U.S. Cl. 75—172 R **3 Claims**

1. An alloy composition comprising 0.3 to 1.0 weight percent hafnium, balance iridium.

3,918,966

LIQUID DEVELOPMENT OF AN ELECTRICAL IMAGE IN WHICH A PULSATING FIELD IS EMPLOYED

Kenneth A. Metcalfe, Lockleys; Alwin S. Clements, Largs Bay, and Brian J. Horrocks, Salisbury North, all of Australia, assignors to The Commonwealth of Australia care of The Secretary, Department of Supply, Parkes, Canberra, Australia

Filed Sept. 26, 1973, Ser. No. 401,106

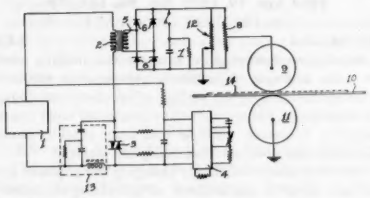
Claims priority, application Australia, Sept. 28, 1972, 629/72

Int. Cl.² G03G *13/10*, *17/00*

U.S. Cl. 96—1 LY **9 Claims**

1. The method of developing an electrical image defined by changes of dielectric constant on a photoconductive surface comprising; subjecting the image, in the presence of a liquid developer comprising developer particles suspended in an electrically insulating liquid, to a pulsating field having a

polarity and intensity to repeatedly break the bonds caused by the Van de Walls forces as the developer particles are drawn to an image area during development, controlling the said pulses to maintain the said developer particles in oscillation during development, but maintaining the electrical image field



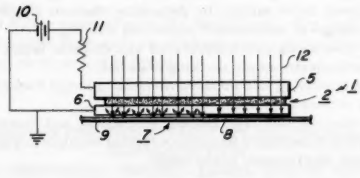
during development to give a directional component to the particle movement to settle the said particles on the image areas. said pulsating field having a fast strong dislodging force followed by a slower decay whereby the particles after dislodgement have time to resettle under the said electrical image field.

3,918,967

CONTACT REFLEX MANIFOLD IMAGING PROCESS

Ivar T. Krohn; Geoffrey A. Page, and Vesvolod Tulagin, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1970, Ser. No. 86
Int. Cl.² G03G *17/00*
U.S. Cl. 96—1 M **33 Claims**



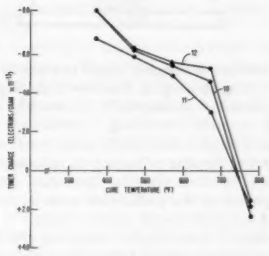
1. A contact reflex imaging process comprising the steps of:
a. providing a manifold set comprising an electrically photosensitive imaging layer, structurally fracturable in response to the combined effect of an applied electric field and exposure to electromagnetic radiation to which said layer is sensitive, sandwiched between a donor sheet and a receiver sheet, said donor and receiver sheets being at least partially transparent to said radiation;
b. contacting one side of said manifold set with a master to be duplicated;
c. applying an electric field across said imaging layer;
d. exposing said master to electromagnetic radiation to which said layer is sensitive through said manifold set said exposure being at least sufficient to provide uniform transfer of said imaging layer in the absence of said master; and
e. separating said set while under said field.

3,918,968

ELECTROPHOTOGRAPHIC PROCESS UTILIZING CARRIER PARTICLES COATED WITH A FLUOROPOLYMER IN DEVELOPMENT

William J. Kukla, Boulder, and Howard E. Munzel, Lafayette, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 110,725, Jan. 28, 1971, Pat. No. 3,798,167. This application Oct. 1, 1973, Ser. No. 402,651
Int. Cl.² G03G *13/08*
U.S. Cl. 96—1.5 D **4 Claims**



1. An electrophotographic process comprising:
forming an electrostatic image on the surface of a photoconductive member;
and contacting the image with a developer mixture comprising finely divided toner particles mixed with carrier particles;
each of said carrier particles comprising a core having a substantially continuous film firmly adhered to its surface;
said film being a material selected from a group of materials with each of the materials comprising a mixture of an inherently triboelectrically negative fluoropolymer and a modifying resin in which the fluoropolymer is essentially insoluble;
and said carrier particles having a desired magnitude of the triboelectric charge characteristic for a selected composition of the material of said toner particles, a selected per cent by weight of said toner particles relative to said carrier particles, and the electrophotographic system with which the developer material is to be used selected from a group of possible magnitudes by selecting the curing temperature of the selected material of said film with the temperature being in a range between 300° and 800° F.

4. An electrophotographic process comprising:
forming an electrostatic image on the surface of a photoconductive member;
and contacting the image with a developer mixture comprising finely divided toner particles mixed with carrier particles;
each of said carrier particles comprising a core having a substantially continuous film firmly adhered to its surface;
said film comprising polytetrafluoroethylene;
and said carrier particles having the magnitude of the triboelectric charge characteristic for a selected composition of the material of said toner particles, a selected per cent by weight of said toner particles relative to said carrier particles, and the electrophotographic system with which the developer material is to be used selected in accordance with the curing process of the selected material of said film in which the material is heated to a temperature in a range between the glass transition temperature of the fluoropolymer and 800° F and then quenched.

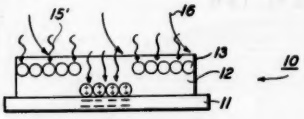
3,918,969
MIGRATION IMAGING METHOD EMPLOYING A UNIFORM EXPOSURE STEP

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 695,238, Jan. 2, 1968, abandoned. This application Jan. 28, 1974, Ser. No. 437,266

Int. Cl.² G03G *13/22*

U.S. Cl. 96—1 PS **11 Claims**



1. A method of imaging which comprises:

a. providing an imaging structure including a support and an overlayer of substantially electrically insulating softenable material containing a particulate material at least one of which is electrically photosensitive, said softenable material capable of having its resistance of migration of said particulate material decreased sufficiently to allow migration of the particulate material through the softenable material toward said substrate,

b. forming a latent charge image on said structure,

c. developing said latent image by decreasing the resistance of the softenable material to migration of the particulate material at least sufficient to allow migration in depth of the particulate material toward the support with the depth of migration differing between particulate material inside and outside the latent image whereby an image is formed by the selective migration of particulate material in image configuration; and

d. uniformly exposing said member at a time subsequent to the beginning of migration of said particulate material during said developing step but before all the migrating particulate material migrates to the support to actinic electromagnetic radiation of at least about 5 to about 3,000 foot-candle-seconds for at least about 1/1000 second to about 1 second thereby terminating the migration of the particulate material.

3,918,970
COLOR XEROGRAPHIC RECORDING METHOD

Masayasu Anzai, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 203,143, Nov. 30, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,442

Claims priority, application Japan, Dec. 2, 1970, 45-105852

Int. Cl.² G03G *5/12*

U.S. Cl. 96—1.2 **6 Claims**

1. A recording sheet for color xerography comprising a base sheet and a photoconductive layer applied to said base sheet, said photoconductive layer comprising a photoconductive emulsion composition, said photoconductive emulsion composition being spectrally sensitive to at least three colors so as to be substantially white taken as a whole, and a plurality of photoconductive areas with respective ones of said photoconductive areas having different spectral sensitivities corresponding to said at least three colors, said plurality of photoconductive areas being randomly densely embedded in said photoconductive emulsion composition in non-overlapping relationship such that each respective photoconductive area has a gradation of spectral sensitivity in the periphery thereof, so that the spectral sensitivities over the layer are gradually varied between adjacent areas, thereby forming said layer.

3,918,971
METHOD FOR CREATING MULTIPLE ELECTROSTATIC COPIES BY PERSISTENT CONDUCTIVITY

Gilbert Zweig, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 19, 1971, Ser. No. 135,179

Int. Cl.² G03G *13/14, 13/22*

U.S. Cl. 96—1.4 **2 Claims**

1. An electrophotographic process for making multiple copies from a single, repetitively rejuvenated electrostatic latent image residing on the surface of an electrophotographic plate comprising a photoconductive insulating layer coated on a conductive substrate, wherein said layer exhibits persistent conductivity said process comprising the steps of:

A. uniformly electrostatically charging the exposed surface of said layer in the absence of activating radiation to a voltage of a first polarity to condition said layer by rendering said layer uniformly non-conductive, thereby converting any pre-existing condition of persistent conductivity in non-image areas to a condition of non-conductivity and also converting any pre-existing image pattern from its given polarity to a condition of being indistinguishable from said pre-existing non-image areas;

B. uniformly electrostatically charging the exposed surface of said layer to a voltage of a second but opposite polarity to sensitize said layer, said opposite polarity voltage being greater than zero and approaching the charge acceptance potential of said layer;

C. subjecting said exposed layer surface to an activating radiation in imagewise configuration corresponding an image to be reproduced to create a varying presistent conductivity non-image area in contrast to said imagewise configuration in said layer, said persistent conductivity non-image area operating to selectively discharge said exposed layer surface and thereby result in electrostatic latent image;

D. developing said electrostatic latent image with electroscopic marking material;

E. transferring said marking material in image formation to a first copy sheet;

F. rejuvenating said electrostatic latent image on said exposed layer surface by depositing thereon electrostatic charges of said second sensitizing polarity;

G. developing said rejuvenated electrostatic latent image with electroscopic marking material;

H. transferring said marking material in image formation to a second copy sheet; and

I. repeating said rejuvenating, developing and transferring steps in sequence to produce further multiple copies from said electrostatic latent image.

3,918,972
IMAGING PROCESS UTILIZING A POLYESTER POLYCONDENSATE CONTAINING SPIROPYRAN PHOTOCHROMIC GROUPS

Georges Gerard Evens, Leuven, and Georges Joseph Smets, Heverlee, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Aug. 13, 1973, Ser. No. 387,805

Claims priority, application United Kingdom, Aug. 24, 1972, 39603/72

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 R **8 Claims**

1. A process for forming stabilized photochromic images, which comprises the steps of:

1. providing a photographic element having a layer or stratum comprising a photochromic polyester polycondensate containing spiropyran photochromic groups as an integral part of the main polycondensate chain, said photochromic polycondensate having a glass transition tem-

perature lower than 120°C, possessing photochromic properties at or above its glass transition temperature, and being derived from the polycondensation of a photochromic compound carrying a hydroxyalkyl group on either side of said photochromic groups,

2. image-wise exposing said photographic element at a temperature at least equal to the glass transition temperature of said photochromic polycondensate so as to effect colouration of said photochromic polycondensate in the exposed areas, and
3. immediately cooling the thus exposed photographic element to a temperature below the glass transition temperature of said photochromic polycondensate so as to stabilize the colouration formed in the exposed areas.

3,918,973

PROCESS AND MATERIALS FOR THE INFORMATION-ISE PRODUCTION OF AMINO COMPOUNDS

Ludovicus Maria Mertens, Borgerhout, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

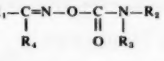
Filed Jan. 30, 1974, Ser. No. 437,762

Claims priority, application United Kingdom, Jan. 31, 1973, 4845/73

Int. Cl.² G03C *5/24, 1/00, 1/52*

U.S. Cl. 96—48 R **15 Claims**

1. In a recording process in which an amine is imagewise released from an amine source carried in effective amount on a support and including the step of imagewise exposing said support to activating radiation, the improvement wherein said amine source is a thermo- or photosensitive amine progenitor corresponding to the following general formula:



in which:

R_1 represents (1) an aliphatic group or a cycloaliphatic group, (2) an aryl group, (3) a heterocyclic group, or (4) an acyl group, and

R_2 represents (1) an aliphatic group or a cycloaliphatic group, (2) an aryl group, or (3) a heterocyclic group, and

R_3 represents (1) hydrogen, (2) an aliphatic group or a cycloaliphatic group, (3) an aryl group, or (4) a heterocyclic group, or

R_3 and R_2 for together part of a heterocyclic ring, and

R_4 represents hydrogen, an aliphatic group, a cycloaliphatic group or an aromatic group.

3,918,974

PROCESS FOR THE DIAZO-TYPE MULTICOLOR REPRODUCTION

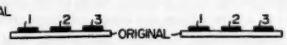
Kouzi Nihyakumen; Toshihiro Kouchi, both of Hirakata; Taizo Yokoyama, Shinmorishoji; Yasuo Ueda, Kobe; Yasutoki Kamezawa, Hirakata, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 139,442, May 3, 1973, abandoned. This application Sept. 13, 1973, Ser. No. 396,667

Claims priority, application Japan, May 1, 1970, 45-36851

Int. Cl.² G03C *5/34, 1/58*

U.S. Cl. 96—49 **10 Claims**



1. A process for multi-color reproduction which comprises:

A. exposing image-wise a diazo-type photosensitive material to actinic light by exposing through an original sheet of an assembly, said assembly consisting of (i) an original sheet having opaque image areas and transparent non-image areas on a surface and a layer containing at least one thermovolatile or sublimable azo coupler (a) and a solid organic sublimable compound selected from the group consisting of camphor, naphthalene, bornane, menthol and p-dichlorobenzene, and said layer being located in only pre-selected areas which are contiguous with opaque image areas of said original sheet, said pre-selected area being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c), an acidic stabilizer and an azo coupler (b) having a substantially lower rate of coupling with the diazonium salt (c) under the developing conditions than that of the azo coupler (a), said original sheet (i) being superposed on said diazo-type photosensitive material (ii) so that the layer of the azo coupler (a) comes into face-to-face contact with the phostosensitive layer;

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence (A) to (B) or (B) to (A); and

(C) contacting the exposed photosensitive material with a mixture of ammonia and steam or an alkali-containing aqueous liquid developer to thereby develop said photosensitive material, whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)-(a) having a certain hue or color is formed by the selective reaction of the heat-transfered coupler (a) with the diazonium salt (c) and at the same time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred, a dye (c)-(b) having a different hue or color from said dye (c)-(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multi-colored copied image.

6. The process for multi-color reproduction which comprises:

A. exposing image-wise a diazo-type photosensitive material to actinic light by exposing through an original sheet of an assembly, said assembly consisting of (i) an original sheet having opaque image areas and transparent non-image areas on a surface and a layer containing at least one thermovolatile or sublimable azo coupler (a) and a solid organic sublimable compound selected from the group consisting of camphor, naphthalene, bornane, menthol and p-dichlorobenzene, and said layer being located in only pre-selected areas which are contiguous with opaque image areas of said original sheet, said pre-selected area being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c), said original sheet (i) being superposed on said diazo-type photosensitive material (ii) so that the layer of the azo coupler (a) comes into face-to-face contact with the photosensitive layer;

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence of (A) to (B) or (B) to (A); and

C. thereafter developing the exposed photosensitive layer with an alkaline aqueous liquid developer containing an azo coupler (b) having a substantially lower rate of coupling with the diazonium salt (c) under the developing conditions than that of the azo coupler (a), whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)-(a) having a certain hue or color is formed by the selective reaction of the heat-transferred coupler (a) with the diazonium salt (c) and at the samd time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred, a dye (c)-(b) having a different hue or

color from said dye (c)-(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multi-colored copied image.

3,918,975

NAPHTHOLIC COUPLERS

Enzo Coraluppi; Elio de Saraca, both of Carcare, and Lorenzo Vittore, Pietra Ligure, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1972, Ser. No. 311,317

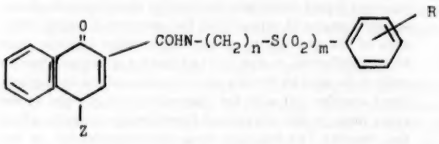
Claims priority, application Italy, Dec. 21, 1971, 54921/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *7/00, 7/04, 1/40, 5/30*

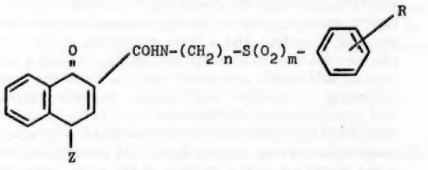
U.S. Cl. 96—56.1 **11 Claims**

1. A silver halide photographic emulsion containing at least one coupler of the formula:



wherein R is hydrogen or an alkyl radical having 1–18 carbon atoms; Z is hydrogen or a substituent which is expelled during the coupling reaction with an oxidation product of a primary amine developer; *m* is 0 and 1; *n* is 1, 2, 3 and 4.

3. A p-phenylene diamine color developing bath containing at least one coupler of the formula:



wherein R is hydrogen or an alkyl radical having 1–18 carbon atoms; Z is hydrogen or a substituent which is expelled during the coupling reaction with an oxidation product of a primary amine developer; *m* is 0 and 1; and *n* is 1, 2, 3 and 4.

3,918,976

POLYESTER FILM WITH ANTHROQUINONE DYE FOR A PHOTOGRAPHIC FILM SUPPORT

Atsuaki Arai; Masaki Okazaki; Noburo Hibino, and Kunihira Seto, all of Minami ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami ashigara, Japan

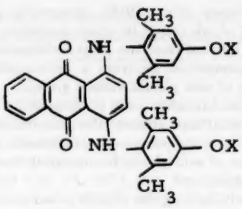
Filed May 24, 1973, Ser. No. 363,702

Claims priority, application Japan, May 24, 1972, 47-51500

Int. Cl.[2] G03C *1/84, 1/78*

U.S. Cl. 96—84 R **4 Claims**

1. A photographic film having a support comprising a polyethylene terephthalate film containing at least one compound represented by the formula:



wherein X represents a hydrogen atom; an alkyl group having 1–15 carbon atoms; a cycloalkyl group; an aryl group substituted by an alkyl group having 1–10 carbon atoms, a carboxyl group, or a halogen atom; an aralkyl group; or an aralkyl group substituted by an alkyl group having 1–10 carbon atoms, a carboxyl group, or a halogen atom, the size of said compound being less than the wave length of visible light and said compound having been mixed with said polyethylene terephthalate under melting condition and a silver halide light-sensitive emulsion layer coated on said support.

3,918,977

METHOD FOR COATING METALLIC STRIPS

Michael Hammond, Ulster, Pa., and Michael Cheresnowsky, Waverly, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 289,139, Sept. 14, 1972, abandoned. This application Aug. 13, 1973, Ser. No. 387,762

Int. Cl.[2] G03C *1/94*

U.S. Cl. 96—86 R **5 Claims**

1. In a method for applying a substantially uniform coating of an aqueous solution of a photosensitive material to at least one surface of a substantially vertically moving metallic strip for being later subjected to a photoetching process wherein said method comprises withdrawing said metallic strip in a substantially vertical direction from said aqueous solution of photosensitivee material within a container adapted for containing said material and thereafter exposing said material on said surface to a preestablished heat source whereby said material is dried, the improvement comprising:

providing an aqueous solution of a photosensitive material selected from the group consisting of aqueous solutions of photosensitive materials having a specific gravity within the range of from about 0.950 to about 1.016 and a viscosity within the range of from about 12.0 to about 28.0 centipoises and aqueous solutions of photosensitive materials having a specific graivty within the range of from about 1.030 to about 1.040 and a viscosity within the range of from about 3.0 to about 8.0 centiposies; and withdrawing said metallic strip from said aqueous solution at a rate within the range of from about 8 inches per minute to about 50 inches per minute to provide a predetermined time period within the range of from about 1 minute to about 11 minutes immediately after said withdrawing of said strip from said solution and prior to said exposing of said strip to said heat source whereby said photosensitive material on said surface of said strip is permitted to flow in a substantially downward direction in such a manner so as to achieve uniformity of thickness.

3,918,978

SILVER HALIDE EMULSIONS CONTAINING 8-SUBSTITUTED CARBOCYANINE DYES

John R. Owen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 185,453, Sept. 30, 1971. This application Sept. 21, 1973, Ser. No. 399,580
Int. Cl.² G03C 1/18
U.S. Cl. 96—135 4 Claims

1. A light-sensitive photographic silver halide emulsion spectrally sensitized with a carbocyanine dye having first and second 5 to 6 membered heterocyclic nuclei selected from the group consisting of thiazoles, oxazoles, selenazoles, thiazolines, 2-pyridines, 4-pyridines, imidazoles, quinolines, 3,3-dialkylindolenines, [4,5-b] quinoxalines, 3H-pyrrolo-[2,3-b] pyridines, and thiazolo-[4,5-b] quinolines, joined together through an acyclic trimethine chain linkage, said trimethine chain linkage being substituted at a terminal carbon atom with an amino group or an amido group.

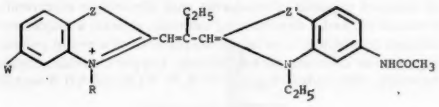
3,918,979

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Akira Sato; Tadashi Ikeda; Keisuke Shiba, and Haruo Takei, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation-in-part of Ser. No. 182,505, Sept. 21, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,687
Claims priority, application Japan, Sept. 21, 1970, 45-82768
Int. Cl.² G03C 1/18
U.S. Cl. 96—137 5 Claims

1. A silver halide photographic emulsion containing at least one sensitizing carbocyanine dye of the formula:



wherein Z and Z' each represents a sulfur or a selenium atom; W represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group; and R represents a γ-sulfopropyl, γ-sulfobutyl or δ-sulfobutyl group, said emulsion having a high red sensitivity, particularly in the range from 635 mμ to 665 mμ.

3,918,980

BONDED SOLDERABLE SILVER ARTICLE, COMPOSITION, AND METHOD OF BONDING SILVER TO A CERAMIC SUBSTRATE

Baynard R. Smith, and Arnold W. Treptow, both of North Palm Beach, Fla., assignors to Electro Oxide Corporation, Palm Beach Gardens, Fla.

Filed Feb. 15, 1974, Ser. No. 442,746
Int. Cl.² C09D 5/24
U.S. Cl. 106—1 12 Claims

1. A metallizing composition comprising an intimate mixture on a weight basis, of: (a) about 1.0–6.0 percent of an initial mixture of cadmium oxide powder and at least one copper oxide powder selected from the group consisting of cuprous oxide and cupric oxide, said copper oxide and cadmium oxide being combined in a weight ratio of between 1.0–5.0 parts of said copper oxide to 1.0 part of said cadmium oxide; (b) about 1.0–8.0 percent of palladium powder; (c) about 0.2–3.0% of rhuthenium oxide; (d) the balance of said intimate mixture being at least one silver particulate material selected from the group consisting of silver and silver oxide; and, (e) about 10.0–60.0 percent by weight of said intimate mixture of an organic binder devoid of glass frits.

3,918,981

FUNGICIDAL DISPERSION, PAPER AND PROCESS

William Joseph Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 280,629, Aug. 14, 1972, abandoned. This application July 22, 1974, Ser. No. 490,625
Int. Cl.² C09D 5/14; C08L 9/00
U.S. Cl. 106—15 AF 6 Claims

1. A storage stable, aqueous dispersion of a generally water-insoluble metal quinolinolate salt consisting essentially of by weight a fungicidally effective amount of a metal salt of a hydroxyquinoline; water; and about 2 to about 40% of a binder emulsion selected from the group consisting of a wax, rosin, acrylic, styrene, butadiene-styrene, butadiene-acrylonitrile and polyethylene; and a minor effective amount of a colloidal suspending agent selected from the group consisting of xanthan gum, methyl-cellulose, carboxymethylcellulose, and an alginate.

3,918,982

BLACK CERAMIC BODY

Lewis Frederick Hart, Bridgewater, and Robert Leroy Buttle, Sumit, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,457
Int. Cl.² C04B 33/26
U.S. Cl. 106—46 2 Claims

1. A ceramic body, exhibiting black or near-black coloration and having good physical strength, after being fired in a reducing atmsophere and

consisting essentially of by weight 65 to 96% Al_2O_3, 1 to 10% SiO_2, 1 to 5% TiO_2 and 2 to 12% Cr_2O_3.

3,918,983

SULFATED CASTOR OIL SUBSTITUTE AND ITS USE IN TEXTILE TREATMENT

John G. Papalos, Ledgewood, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 28, 1974, Ser. No. 437,053
Int. Cl.² C08L 91/00
U.S. Cl. 106—244 8 Claims

1. A composition comprising a sulfated mixture of

a. from about 10% to about 70% by weight of at least one aliphatic alcohol having from about 4 to about 30 carbon atoms, and

b. from about 90% to about 30% by weight of at least one unsaturated oil excluding castor oil.

3,918,984

COATING COMPOSITION

Gerald S. High, Detroit, and Bhimashanker G. Dhake, Livonia, both of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed Sept. 21, 1973, Ser. No. 399,376
Int. Cl.² C09C 1/64
U.S. Cl. 106—290 11 Claims

1. An aqueous non-leafing aluminum flake composition containing a water reducible film forming polymer with non-

leafing aluminum particles dispersed therein in the presence of a surfactant combination consisting essentially of:

a. at least one partial ester of a long chain fatty acid exhibiting from 12 to 18 carbon atoms and a polyhydroxylic organic compound selected from the group consisting of hexahydric alcohols, internal ethers of hexahydric alcohols, external ethers of hexahydric alcohols and mixtures of internal and external ethers of hexahydric alcohols; and

b. a polyoxyethylene ether of at least one partial ester of a long chain fatty acid exhibiting from 12 to 18 carbon atoms and a polyhydroxylic organic compound selected from the group consisting of hexahydric alcohols, internal ethers of hexahydric alcohols, external ethers of hexahydric alcohols and mixtures of internal and external ethers of hexahydric alcohols.

3,918,985

TRANSPARENT YELLOW IRON OXIDE PIGMENT

Franz Ludwig Ebenhoech, Ludwigshafen; Dietmar Werner, Weisenheim; Gustav Bock, Neustadt; Gerd Wunsch, Speyer; Karl Opp, Heidelberg, and Werner Ostertag, Willstaett, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1974, Ser. No. 501,042

Int. Cl.² C09C *1/24*

U.S. Cl. 106—304 **5 Claims**

1. A transparent yellow iron oxide pigment which is amorphous according to X-ray diffraction, and has the formula $C_o.01-0.05.Fe^{+3}2.960-2.999$.

3,918,986

COMPOSITE MALTITOL POWDER

Takashi Hiraiwa, Yokohama, Japan, assignor to Nikken Chemicals Co., Ltd., Tokyo, Japan

Filed June 21, 1974, Ser. No. 481,765

Claims priority, application Japan, Aug. 14, 1973, 48-090567; June 21, 1973, 48-69234

Int. Cl.² A23L *1/22*, *1/236*; C13K *13/00*

U.S. Cl. 127—29 **11 Claims**

1. A low caking composite maltitol powder, which comprises: core particles containing more than 50% by weight of maltitol and a coating of fine saccharide particles having a diameter less than ½ the diameter of the core particles.

3,918,987

SURGEON HAND AND ARM SCRUBBING APPARATUS

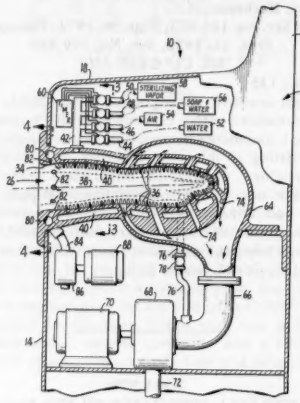
Rudolph J. Kopfer, 137 Almenr Drive, Greenbrae, Calif. 94904

Filed Nov. 9, 1973, Ser. No. 414,360

Int. Cl.² B08B *3/02*

U.S. Cl. 134—95 **11 Claims**

1. A hand and forearm spray cleaning apparatus comprising a housing having a pair of cavities therein, each cavity having a longitudinal axis of symmetry and being suitable for receiving a separate hand and forearm, a plurality of nozzles within each cavity which are directed towards the axis of symmetry, and means for pumping fluid through the nozzles at a predetermined rate and pressure so as to exert a net force on the



inserted hands and forearms sufficient to support their weight within each cavity.

3,918,988

ELECTRIC CURRENT-PRODUCING CELLS

Sandors G. Abens, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 808,651, March 19, 1969, abandoned. This application Jan. 19, 1972, Ser. No. 219,185

Int. Cl.² H01M *39/04*

U.S. Cl. 136—6 LN **13 Claims**

1. An electric current-producing cell comprising a lithium metal anode, an electrolyte consisting essentially of methyl formate and lithium-hexofluoroarsenate dissolved therein in an amount capable of rendering said electrolyte electrically conductive, and a depolarizing cathode, at least a major constituent of which is a metal salt selected from a group consisting of silver chloride, nickel fluoride, copper chloride, copper bromide, and oxides of group IV B, V, VI B and VII B metals.

3,918,989

FLEXIBLE ELECTRODE PLATE

Leland M. Gillman, Denver, and Douglas W. Walker, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Continuation of Ser. No. 107,424, Jan. 18, 1971, abandoned. This application Aug. 1, 1974, Ser. No. 493,817

Int. Cl.² H01M *43/04*

U.S. Cl. 136—24 **10 Claims**

1. A method for preparing a pasted flexible electrode plate consisting essentially of the steps of:

a. formulating an aqueous paste mixture comprising (1) electrochemically active material selected from the group consisting of mercuric oxide, manganese dioxide, zinc, cadmium, iron, indium, magnesium, aluminum and lead, (2) water-soluble resin binder material and (3) an amount of compatible hydrophilic plasticizer sufficient to impart flexibility to the finished plate;

b. securing the paste to an electrically conductive substrate to form the electrode plate;

c. drying the electrode plate at temperatures in the range of about 50°–90°F. under controlled humidity conditions to prepare said pasted flexible electrode plate in a finished state without further treatment.

5. A flexible electrode plate for use as an anode of a rechargeable alkaline galvanic cell comprising:

a. an electrically conductive substrate;

b. a paste formulation secured to the substrate comprising: electrochemically active zinc; water-soluble resinous binder in an amount from about 0.1 to about 5 weight percent of the plate;

hydrophilic polyethylene glycol plasticizer having an average molecular weight of from about 4,000 to about 20,000, said plasticizer being compatible with the binder and active material and present in an amount between about 5 to about 50 weight percent based on the binder and in any event present in sufficient amount to impart substantialy flexibility to said flexible electrode plate.

10. A flexible electrode plate for use as the anode of a rechargeable alkaline galvanic cell comprising:

a. an electrically conductive substrate;

b. a paste formulation secured to the substrate comprising: electrochemically active cadmium;

water-soluble resinous binder in an amount from about 0.1 to about 5 weight percent of the plate;

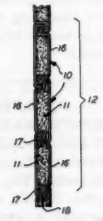
hydrophilic polyethylene glycol plasticizer having an average molecular weight of from about 4,000 to about 20,000, said plasticizer being compatible with the binder and active material and present in an amount between about 5 to about 50 weight percent based on the binder and in any event present in sufficient amount to impart substantial flexibility to said flexible electrode plate.

3,918,990

ALKALINE STORAGE BATTERY AND ZINC NEGATIVE ELECTRODE THEREFOR

Robert F. Enters, Hackensack, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 25, 1974, Ser. No. 518,091
Int. Cl.² H01M *4/38*
U.S. Cl. 136—28 **5 Claims**



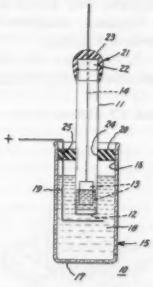
1. An alkaline-electrolyte storage battery comprising alternate nickel-positive and zinc-negative plates in a pack arrangement wherein each negative plate comprises a plurality of perforated metal strip pockets seamed together along their edges and containing active material wherein each perforated metal strip pocket of the negative plates comprises two metal strips perforated throughout their central portions lengthwise thereof and having the edges in telescoping interlocking engagement and the ends crimped closed, a felt separator applied across the opposite sides of each negative-zinc plate, an ionic-membrane tape wrapped around the felt-covered zinc-negative plate, and a plastic mesh insulator applied across the opposite sides of each positive-nickel plate.

3,918,991

SODIUM-HALOGEN BATTERY

Heinrich J. Hess, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 291,806, Sept. 25, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,762
Int. Cl. H01m *23/02*
U.S. Cl. 136—83 R **6 Claims**



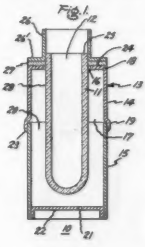
1. A sodium-halogen battery comprising a casing, an anode positioned in the casing, the anode consisting of sodium in a non-aqueous organic electrolyte of pure 1,2-dimethoxyethane containing a dissolved sodium salt therein, the salt se.ected from the class consisting of sodium perchlorate and sodium bromide, a solid sodium ion-conductive electrolyte contacting the anode, and a non-aqueous halogen cathode contacting the opposite side of the solid electrolyte.

3,918,992

BATTERY CASING AND SEALED PRIMARY SODIUM-HALOGEN BATTERY

Fritz G. Will, Scotia, and Robert R. Dubin, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 428,419, Dec. 26, 1973, Pat. No. 3,868,273. This application Sept. 24, 1974, Ser. No. 508,748
Int. Cl.² H01M *23/00*
U.S. Cl. 136—83 R **2 Claims**



1. A battery casing comprising an inner casing of a solid sodium ion-conductive material with one open end, an outer metallic casing comprising an upper portion and a lower portion, the upper portion with opposite open ends, an inwardly extending flange affixed to the upper portion at its first open end, the lower portion with opposite open ends, a removable closed end for its first open end, and an opening in the removable closed end, the upper and lower portions joined together at their associated second open ends, the outer metallic casing surrounding the inner casing with the exterior surface of the flange on a lower plane than the surface of the open end of the inner casing and spaced from the inner casing, a cap with a

flange positioned adjacent the flange of the upper portion of the outer metallic casing, and a single low temperature melting glass seal sealing together the flange of the upper portion of the outer metallic casing and the cap flange and sealing the flanges to the outer wall of the inner casing adjacent its open end.

3,918,993

ELECTRIC BATTERY TERMINAL SEALS

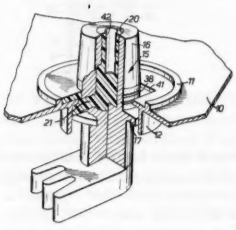
Edward Adderley, Hadfield, and Derek Kurt Schwendener, Wilmslow, both of England, assignors to Electric Power Storage Limited, London, England

Filed Apr. 2, 1974, Ser. No. 457,187

Claims priority, application United Kingdom, Apr. 3, 1973, 15986/73

Int. Cl. H01m *1/02*

U.S. Cl. 136—135 S **3 Claims**



1. An electric storage battery having a terminal seal formed by a body of sealing material in an annular well whose outer wall is afforded by the battery lid while its inner wall is afforded by the terminal post, the terminal post having in it a vertical bore with its upper end open and one or more lateral passages extending generally radially from its lower end to the annular well and being filled with the sealing material.

3,918,994

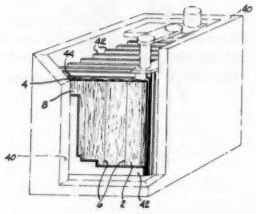
BATTERY PLATE RETAINER MAT AND METHOD OF MANUFACTURE

Lyman Clifford Davis, Fort Saskatchewan, Canada, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 28, 1973, Ser. No. 419,824

Int. Cl.² H01M *2/14*

U.S. Cl. 136—145 **28 Claims**



1. A battery plate retainer mat or separator consisting essentially of:

a. a first continuous electrolyte permeable layer of matted electrically insulative and electrolyte resistant fibers and containing essentially no binder materials;

b. a second electrolyte-permeable layer of electrolyte resistant fibers bound together with a binder;

c. said first layer being attached to said second layer such that a major surface of said first layer contacts a major surface of said second layer, with attachments selectively spaced over at least one of the major surfaces of said first and second layers whereby only portions of said first layer are attached to adjacent portions of said second layer.

3,918,995

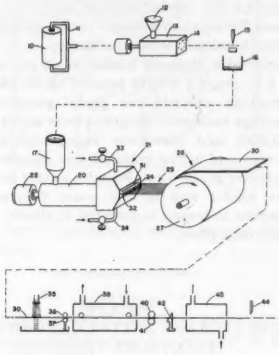
BATTERY SEPARATOR AND MANUFACTURING PROCESS

Nigel Innes Palmer, Lexington; Nathan Sugarman, Needham, and Don O'Neil Grammer, Scituate, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 317,108, Dec. 12, 1972, Pat. No. 3,847,676. This application Sept. 9, 1974, Ser. No. 504,608

Int. Cl.² H01M *2/14*

U.S. Cl. 136—145 **6 Claims**



1. A battery with a positive plate, a negative plate and a separator from polymeric resin having a degree of undesirable hydrophobia, solid below solid (at minus) F, extrudable as a hot melt and resistant to degradation by at least either acids or alkalies positioned between said plates, said separator comprising a nonwoven mat of fibers, said fibers comprised of said polymeric resin and a first wetting agent dispersed throughout said resin, said fibers having a coating on their outer surfaces and said coating being a second wetting agent, said first wetting agent blooming to the surface of said fiber when said fiber is subjected to heat and pressure and during use over a period of time.

3,918,996

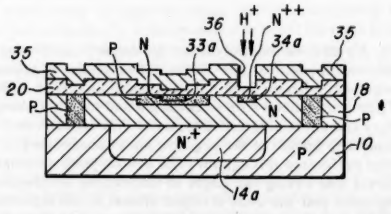
FORMATION OF INTEGRATED CIRCUITS USING PROTON ENHANCED DIFFUSION

Ian H. Morgan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 85,931, Nov. 2, 1970, abandoned. This application Mar. 1, 1973, Ser. No. 337,029

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **6 Claims**



1. A method for electrically isolating a selected region of an epitaxial layer in an integrated circuit structure having a substrate of one type conductivity and an epitaxial layer of oppo-

site type conductivity formed thereupon, comprising the steps of:

a. doping a selected surface area of said epitaxial layer surrounding the selected region thereof to be electrically isolated with an impurity introduced a relatively short distance into said epitaxial layer to produce a shallow region of the same conductivity type as said substrate and spaced from said substrate by a major portion of the thickness of said epitaxial layer; and

b. selectively bombarding said doped selected surface area with protons to enhance diffusion of said impurity through the thickness of said epitaxial layer to form a continuous doped region extending through said epitaxial layer to said substrate, the periphery of said continuous doped region forming a boundary through said epitaxial layer that is substantially perpendicular to the surface thereof in which the doping of the selected surface area occured, the said bombarding being effected while maintaining the integrated circuit structure at a temperature below about 1000°C.

3,918,997

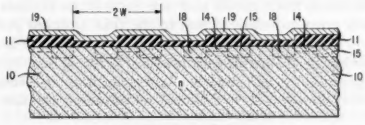
METHOD OF FABRICATING UNIPHASE CHARGE COUPLED DEVICES

Amr Mohamed Mohsen, North Plainfield, and Carlo Heinrich Sequin, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1974, Ser. No. 530,507

Int. Cl.[2] H01L *21/263*

U.S. Cl. 148—1.5 **13 Claims**



1. A method of forming a uniphase charge coupled device comprising the steps of:

forming on the semiconductor storage medium a first pattern of insulating material comprising regions of sufficiently thick insulating material to act as barriers to implantation of ions in the semiconductor, each of said regions having a width W and being separated from adjacent regions by the distance W where W is one-half the desired cell length;

forming over said insulating pattern a mask pattern in the form of discrete regions of width W such that each mask region overlies a portion of a barrier region and a portion of the space between barrier regions,

exposing said structure to an ion beam so as to form implanted surface charge regions in said semiconductor only in the areas not covered by a mask region or barrier region;

forming insulating material over the area of the semiconductor including said surface regions so as to form a second insulating pattern comprising alternating relatively thick and thin regions where each region has a width W and the thick regions cover at least a portion of the semiconductor not covered by the previous barrier regions of the first insulating pattern; and

forming a layer of conducting material over said insulating pattern.

3,918,998

METHOD FOR PRODUCING SUPERCONDUCTING WIRE AND PRODUCTS OF THE SAME

William G. Marancik, and Frederick T. Ormand, both of Basking Ridge, N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Mar. 19, 1973, Ser. No. 342,895

Int. Cl. C21d *9/52*; **H01v** *11/14*

U.S. Cl. 148—11.5 R **12 Claims**

1. A method for producing a composite superconducting wire including a high-field Type II superconducting strand embedded in a conductive metallic matrix of normal material, comprising the steps of:

assembling a composite body including a rod surrounded by said matrix, said rod comprising a metal which forms an intermetallic compound characterized as a high-field Type II superconductor upon high temperature diffusion reaction with an alloying element of said matrix;

extruding said composite to an intermediate diameter;

hot drawing said intermediate diameter composite to a final diameter by multiple passes through drawing dies at temperatures above about 100°C but below the diffusion temperature range within which substantial diffusion occurs between the alloying element of said matrix and the material of said rod, said composite being reduced in cross-sectional area appproximately 15 to 20% per draw; and

subjecting said composite at said final diameter to reaction at a high temperature within said diffusion temperature range for an extended period required for substantial diffusion of said matrix alloying element into said rod and the formation of a superconducting layer adjacent the interface between said matrix and said rod.

3,918,999

METHOD FOR PRODUCING EFFICIENTY A HIGH TOUGHNESS AND HIGH TENSILE STRENGTH STEEL MATERIALS

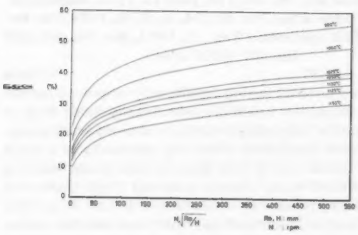
Hiroshi Sekine; Tadakatsu Maruyama, both of Tokyo, and Katsutoshi Yamada, Tokai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 15, 1973, Ser. No. 406,283

Claims priority, application Japan, Oct. 19, 1972, 47-103991

Int. Cl.[2] C21D *7/14*

U.S. Cl. 148—12 F **10 Claims**



1. A method for efficiently producing a high toughness and high tensile strength steel material which comprises heating a low-carbon or low-carbon, low-alloy steel slab which contains not more than 0.30% C, and not more than 0.15% Nb, and hot rolling the slab, said hot rolling step comprising giving the slab at least one reduction in an amount not smaller than that shown by each of the curves or the interpolated curves shown in FIG. 1 as determined by the constant $N\sqrt{R_r/H}$ wherein R_r is the roll radius (mm) of the rolling mill, N is the roll rotation speed (rpm) and H is the slab thickness before the reduction.

3,919,000

PREANNEAL RINSE PROCESS FOR INHIBITING RUST ON STEEL STRIP

Robert Warren Yarrington, Ambler, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed June 15, 1973, Ser. No. 370,497
Int. Cl.[2] C21D *1/00*
U.S. Cl. 148—14 5 Claims

1. A process for inhibiting rust formation on coldrolled steel strip which comprises contacting the strip, prior to annealing with an aqueous dilute rinse solution containing an effective rust-inhibiting amount of a mixture of calcium ion and sodium nitrite, the calcium ion being supplied by a soluble calcium salt having a solubility in water of at least 1.88 g/liter of Ca^{++} ion and being free of corrosion-promoting anions selected from the class consisting of sulfate and chloride, wherein the concentration of calcium ion in the solution is from about 0.25 to 3 oz. per gallon and the concentration of sodium nitrite is from about 0.13 to 3 oz. per gallon, drying the steel strip and annealing the strip in a reducing gas atmosphere.

3,919,001

SINTERED RARE-EARTH COBALT MAGNETS COMPRISING MISCHMETAL PLUS CERIUM-FREE MISCHMETAL

Devineni V. Ratnam, Scott Township, Allegheny County, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 448,141
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—31.57 3 Claims

1. A permanent magnet having an energy product of 10 to 17 MGOe, a sintering temperature of 2000°F max. and a stability parameter of 0.8 to 2 H_K/B_r, said magnet being produced from compacted and sintered particles of a CoRE compound where RE is a combination of rare-earth elements within the range of 32 to 42% by weight and balance cobalt, with said total combination of rare-earth elements consisting essentially of, in weight percent, up to 30 samarium, 25 to 75 mischmetal, and 25 to 75 substantially cerium-free mischmetal containing less than about 3 cerium.

3,919,002

SINTERED COBALT-RARE EARTH INTERMETALLIC PRODUCT

Mark C. Benz, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 263,115, June 15, 1972, abandoned, which is a division of Ser. No. 33,224, April 30, 1970, Pat. No. 3,695,945. This application Feb. 11, 1974, Ser. No. 441,289
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—31.57 1 Claim

1. A sintered product having significantly enhanced permanent magnet properties which are substantially stable in air at room temperature consisting essentially of compacted particulate cobalt-rare earth alloy consisting essentially of a Co_5R intermetallic phase and a CoR intermetallic phase which is richer in rare earth metal content than said Co_5R phase, said Co_5R phase being present in an amount of at least 65 percent by weight of said product, and said CoR phase which is richer in rare earth metal content than said Co_5R phase being present in a positive amount ranging up to 35 percent by weight of said product, where R is a rare earth metal or metals, said sintered product having a density of at least 87 percent of theoretical and having pores which are substantially noninterconnecting and wherein the component grains have an average size less than 30 microns, said sintered product being produced by providing a solid alloy of cobalt and rare earth metal in particulate form having an average size ranging up to about 10 microns, said cobalt and rare earth metal being used in amounts substantially corresponding to that desired in the sintered product and being comprised of a major amount of Co_5R intermetallic phase and a second phase of CoR which is richer in rare earth metal content than said Co_5 R phase, pressing said particulate alloy into a green body and sintering said green body in a substantially inert atmosphere to produce said sintered product.

3,919,003

SINTERED COBALT-RARE EARTH INTERMETALLIC PRODUCT

Mark G. Benz, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 209,372, Dec. 17, 1971, abandoned, which is a division of Ser. No. 33,348, April 30, 1970, Pat. No. 3,655,463. This application Feb. 11, 1974, Ser. No. 440,985
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—31.57 1 Claim

1. A sintered product having significantly enhanced permanent magnet properties which are substantially stable in air at room temperature consisting essentially of compacted particulate cobalt-rare earth alloy consisting essentially of a Co_5R intermetallic phase and a CoR intermetallic phase which is richer in rare earth metal content than said Co_5R phase, said Co_5R intermetallic phase being present in an amount of at least 65% by weight of said sintered product and said CoR intermetallic phase which is richer in rare earth content than said Co_5R phase being present in a positive amount having a value ranging up to 35% by weight of said product, where R is a rare earth metal or metals, said sintered product having a density of at least 87 percent of theoretical and having pores which are substantially non-interconnecting and the component grains have an average size less than 30 microns, said sintered product being produced by admixing particles of a base cobalt-rare earth metal alloy and an additive cobalt-rare earth metal alloy, said particles having an average size ranging up to about 10 microns, said base alloy existing at sintering temperature as a solid Co_5R intermetallic phase and said additive alloy being a solid at sintering temperature and being richer in rare earth metal content than said base alloy, said base alloy and said additive alloy each being used to form a mixture which has a cobalt and rare earth metal content substantially corresponding to that of the final sintered product with said additive alloy being present in an amount of at least 0.5 percent by weight of said mixture, pressing said mixture into a green body, and sintering said green body in a substantially inert atmosphere to produce said sintered product.

3,919,004

LIQUID SINTERED COBALT-RARE EARTH INTERMETALLIC PRODUCT

Mark G. Benz, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 209,373, Dec. 17, 1971, abandoned, which is a division of Ser. No. 33,347, April 30, 1970, Pat. No. 3,655,464. This application Feb. 15, 1974, Ser. No. 442,870
Int. Cl.[2] H01C *1/02*
U.S. Cl. 148—31.57 1 Claim

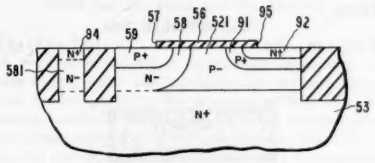
1. A sintered product having significantly enhanced permanent magnet properties which are substantially stable in air at room temperature consisting essentially of compacted particulate cobalt-rare earth alloy consisting essentially of a Co_5R intermetallic phase and a CoR intermetallic phase which is richer in rare earth metal content than said Co_5R phase, said Co_5R intermetallic phase being present in an amount of at least 65% by weight of said sintered product and said CoR intermetallic phase which is richer in rare earth metal content than said Co_5R phase being present in a positive amount having a value ranging up to 35% by weight of said product, where R is a rare earth metal or metals, said sintered product having a density of at least 87 percent of theoretical and having pores which are substantially non-interconnecting and wherein the component grains have an average size less than 30 microns, said sintered product being produced by admixing particles of a base cobalt-rare earth metal alloy and an additive cobalt-rare earth metal alloy, said particles having an average size ranging up to about 10 microns, said base alloy

existing at sintering temperature as a solid Co_5R intermetallic phase and said additive alloy existing at sintering temperature as at least a partly liquid phase and being richer in rare earth metal content than said base alloy, said base alloy and said additive alloy each being used to form a mixture which has a cobalt and rare earth metal content substantially corresponding to that of the final sintered product with said additive alloy being present in an amount of at least 0.5 percent by weight of said mixture, pressing said mixture into a green body, and sintering said green body in a substantially inert atmosphere to produce said sintered product.

3,919,005
METHOD FOR FABRICATING DOUBLE-DIFFUSED, LATERAL TRANSISTOR

Richard D. Schinella, Mountain View, and Michael P. Anthony, San Carlos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 357,968, May 7, 1973, Pat. No. 3,873,989. This application July 1, 1974, Ser. No. 484,831
Int. Cl.² H01L *21/22, 21/26, 21/76*
U.S. Cl. 148—175 **3 Claims**

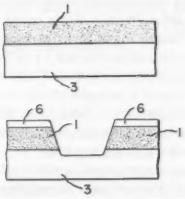


1. A method for fabricating a double-diffused, lateral transistor structure comprising the steps of:
   a. oxidizing a p-type silicon substrate;
   b. forming an opening in the silicon dioxide layer formed by step (a);
   c. predepositing an n^+-type impurity in the portion of the substrate exposed by said opening and heating said substrate to thermally drive said n^+-type impurity into said substrate to form a buried layer;
   d. removing the remaining silicon dioxide formed by step (a) from the surface of said substrate;
   e. epitaxially forming a layer of p-type conductivity on said substrate;
   f. forming a selectively etchable mask on the surface of said p-type epitaxial layer;
   g. removing said mask from said surface of said p-type epitaxial layer except over a portion of the active transistor structure to be formed;
   h. oxidizing the surface of the remaining exposed epitaxial layer to form an impurity-diffusion masking layer;
   i. defining a base diffusion opening in the silicon dioxide material formed by step (h);
   j. predepositing an n-type impurity in said epitaxial layer through said base diffusion opening;
   k. removing the remaining silicon dioxide material formed by step (h);
   l. applying a thermal oxidation masking material over said active transistor structure to be formed;
   m. etching the portion of said epitaxial layer not covered by said thermal oxidation masking material to be approximately one-half its depth;
   n. heating said epitaxial layer to oxidize said etched portion of said epitaxial layer so that the surface of the isolation-forming, thermally grown silicon dioxide corresponds approximately to the plane of the original surface of said epitaxial layer and so that said predeposited n-type impurities diffuse to meet said buried layer;
   o. removing said thermal oxidation masking material applied by step (1);
   p. reoxidizing said epitaxial layer to form a thin protective silicon dioxide layer;
   q. defining said protective silicon dioxide layer formed by step (p) to form emitter and collector contact openings;
   r. predepositing a p-type impurity in said epitaxial layer through said emitter and collector contact openings and heating said epitaxial layer to thermally drive said p-type impurities into said epitaxial layer to form emitter and collector regions, said emitter region stopping short of the diffusion front associated with said base region; and
   s. forming metal contacts to said emitter, base and collector regions.

3,919,006
METHOD OF MANUFACTURING A LATERAL TRANSISTOR

Yasuo Tarui, 6-4, 5-Chome, Minamisawa, Karume, Kitatama-Gun, Tokyo-To; Toshihiro Sekigawa, 4,3-Chome, Kogaya, Kanagawa-Ku, Yokohama, Kanagawa, and Yutaka Hayashi, 9-14, 4-Chome, Hon, Hoya, Tokyo-To, all of Japan

Division of Ser. No. 29,006, April 16, 1970, Pat. No. 3,764,396. This application Sept. 18, 1973, Ser. No. 398,391
Claims priority, application Japan, Sept. 18, 1969, 44-73847; Sept. 18, 1969, 44-73848
Int. Cl.² H01L *21/22, 29/72*
U.S. Cl. 148—175 **1 Claim**



1. A method of manufacturing a lateral transistor which comprises the steps of; forming as a layer on a substrate of semiconductor material which contains an impurity of a first conductivity type, a first region containing an impurity having a high diffusion characteristic of the same type as said substrate and an impurity of the opposite conductivity type having a high concentration and low diffusion characteristic; providing a mask over said first region; providing a window in said mask; forming through said first region a recess to expose said substrate through said window; successively depositing in said recess by epitaxial growth through said window lightly doped second and heavily doped third regions of semiconductor material of said opposite conductivity type, said third region being isolated from said first region by said second region; effecting by heat diffusion a diffusion of impurity of said first conductivity type from said first region into said second region to form between said first and second regions a base region the width of which is determined by the difference in diffusion of said impurities of said first conductivity type and said second conductivity type; and forming electrical contacts with said first, third and base regions, respectively.

3,919,007
METHOD OF MANUFACTURING A FIELD-EFFECT TRANSISTOR

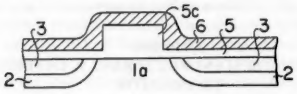
Yasuo Tarui, Tokyo; Yutaka Hayashi, Hoya, and Toshihiro Sekigawa, Yokohama, all of Japan, assignors to Kogyo Gijutsuin, Japan

Division of Ser. No. 61,906, Aug. 7, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,756

Claims priority, application Japan, Aug. 12, 1969, 44-63257; Sept. 18, 1969, 44-73849; Oct. 14, 1969, 44-81501; Oct. 14, 1969, 44-81502; Oct. 14, 1969, 44-81503; Oct. 20, 1969, 44-83209

Int. Cl. H01l *7/44*

U.S. Cl. 148—189 **1 Claim**



1. A method of manufacturing a field-effect transistor comprising base, source and drain regions, a gate electrode and a gate insulating layer, which comprises the steps of:

a. forming a thick insulating layer, having a thickness which is greater than the diffusion length of an impurity forming a base region in a following process step, on a surface of a semiconductor substrate including an impurity of a first conductivity type;

b. removing a portion of said thick insulating layer from the surface of said semiconductor substrate to leave at least one island-like portion of said thick insulating layer on said surface;

c. diffusing first and second impurities successively into said surface of said substrate while using said island-like portion as a diffusion mask to form base and source regions, respectively, in said substrate by diffusing said first impurity to a greater depth than said second impurity, said first impurity being of a second conductivity type opposite to said first conductivity type and said second impurity being of said first conductivity type whereby said substrate becomes a drain region;

d. etching away a portion of said island-like insulating layer to leave a portion of said island-like insulating layer on the surface of said drain region and to expose the surface of said base region;

e. forming an insulating layer thinner than the thickness of said remaining-island like insulating layer on the exposed surface of said base, source and drain regions to form a gate insulating layer consisting of said island-like insulating layer and said thin insulating layer; and

f. then forming a gate electrode on said gate insulating layer.

3,919,008
METHOD OF MANUFACTURING MOS TYPE SEMICONDUCTOR DEVICES

Seiichi Iwamatsu, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

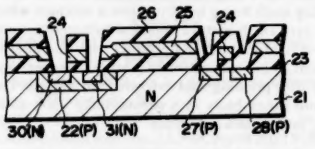
Division of Ser. No. 204,005, Dec. 2, 1971, abandoned. This application July 25, 1973, Ser. No. 382,297

Claims priority, application Japan, Dec. 2, 1970, 45-105840

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **2 Claims**

1. A method of manufacturing a complementary MOS type semiconductor device comprising the steps of preparing an N-type semiconductor substrate, forming a P-type region at a selected portion of said substrate, applying an insulator film to cover said P-type region and said substrate, forming a layer of polycrystalline silicon on said insulator film, removing portions of said polycrystalline silicon layer and of said insulator film to form a first pair of windows above said P-type region and a second pair of windows at another selected portion of said substrate, diffusing a P-type impurity into said N-type substrate through said second pair of windows to form a pair



of source and drain regions and diffusing an N-type impurity into said P-type region through said first pair of windows to form a pair of N-type regions.

3,919,009
METHOD FOR PRODUCING AN IMPROVED THYRISTOR

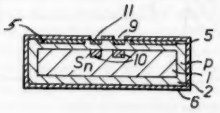
Edgar Borchert, and Karlheinz Sommer, both of Belecke, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Mar. 4, 1974, Ser. No. 448,041

Claims priority, application Germany, Mar. 2, 1973, 2310570

Int. Cl.² H01L *7/44*

U.S. Cl. 148—189 **15 Claims**



1. In a method of producing a controllable thyristor including initially doping a semiconductor body to produce the usual layers of alternating conductivity type required to produce a thyristor; the improvement comprising, thereafter increasing the net doping of the high resistivity base zone of the thyristor in a locally limited region below the portion of the surface of the semiconductor body to which the control electrode is to be attached by diffusing elements which form doping impurities into the semiconductor body in a controlled manner from the cathode side of the thyristor, whereby the pn-junction of the thyristor which changes from the blocking to the conductive state upon firing of the thyristor breaks through initially beneath the control electrode when the forward breakover voltage is exceeded.

3,919,010
METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE WHICH IS PROTECTED AGAINST OVERVOLTAGE

Edgar Borchert, and Karlheinz Sommer, both of Belecke, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 4, 1974, Ser. No. 448,042

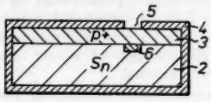
Claims priority, application Germany, Mar. 2, 1973, 2310453

Int. Cl.² H01L *7/44*

U.S. Cl. 148—189 **18 Claims**

1. In a method for producing a semiconductor device which is protected against overvoltage and which includes a semiconductor body having at least one rectifying junction which is to take over a blocking voltage, said method including the step of doping the semiconductor body in the usual manner to produce all of the semiconductor layers with the desired type of conductivity required to form said rectifying junction; the improvement comprising the step of thereafter increasing the net doping in a locally limited region along said rectifying

junction by diffusing a doping substance, which forms doping impurities in the semiconductor material and which is soluble in the material of the semiconductor body only in a small quantity and diffuses in said material at a high speed relative



to the already present doping impurities, into the semiconductor body in a controlled manner so that the breakthrough voltage of the rectifying junction at said region will be smaller than along the remainder thereof.

3,919,011
SOLID PROPELLANT COMPOSITION WITH A POLYURETHANE BINDER

Adolf F. Oberth, Fair Oaks, and Rolf S. Bruenner, Orangevale, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

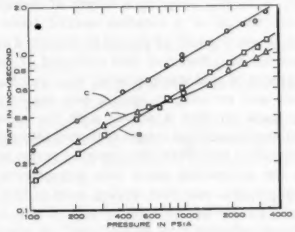
Filed Jan. 10, 1969, Ser. No. 791,540
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **12 Claims**

1. A novel solid propellant formulation containing a polyurethane binder and a solid oxidizing salt, wherein, the polyurethane binder comprises the reaction product of an NCO-terminated urethane prepolymer with an additive selected from the group consisting of metal hydroxides which are water donors and carbon dioxide acceptors under cure conditions, metal chelates which liberate diamine or alkanolamine under cure conditions and quaternary ammonium diols.

3,919,012
PROPELLANT COMPOSITION

William R. McBride; William G. Finnegan, and Arnold Adicoff, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1970, Ser. No. 97,467
Int. Cl.² C06P *45/10*
U.S. Cl. 149—19.5 **4 Claims**

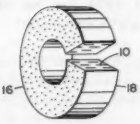


1. A solid propellant formulation comprised of an oxidizer phase consisting of whisker-like crystals of ammonium perchlorate in combination with at least one solid propellant binder selected from the group consisting of hydroxy terminated polybutadiene, carboxy terminated polybutadiene butadiene acrylic acid copolymers, butadiene acrylic acid acrylonitrile terpolymer, polyesters, containing constituents selected from the group consisting of metals, metal organic compounds, metallic hyclrides, ballistic modifiers and combinations thereof.

3,919,013
SLURRY EXPLOSIVE COMPOSITION

Richard Fox, Rosanna, and David Gilbert Hay, Balaclava, Victoria, both of Australia, assignors to ICI Australia limited, Melbourne, Victoria, Australia

Filed Nov. 11, 1975, Ser. No. 372,932
Int. Cl. C06b *45/32*
U.S. Cl. 149—6 **11 Claims**



1. In a slurry explosive composition of matter comprising at least one oxygen releasing salt selected from the group consisting of ammonium nitrate, chlorate and perchlorate, alkali metal nitrates, chlorates and perchlorates, and alkaline earth metal nitrates, chlorates and perchlorates; water; and at least one fuel selected from the group consisting of water soluble fuels, water soluble or sparingly water soluble non-metallic fuel and metallic water insoluble fuel, the combination with said composition of at least one detonation sensitizing material in divided form and comprising at least one metallic component selected from the group consisting of aluminium and alloys rich in aluminium said detonation sensitizing material the improvement wherein there is bonded to the surface of at least part of said metallic component at least one further material derived and selected from the group consisting of alkali metal salts of a resin acid, alkaline earth salts of a resin acid, hydrogenated rosin, dehydrogenated rosin, dimerized rosin and polymerized rosin and wherein said further material constitutes from 0.01 to 0.2% w/w of said detonation sensitizing material.

3,919,014
PREVENTION OF HYDROGEN EMBRITTLEMENT OF HIGH-STRENGTH STEEL BY HYDRAZINE COMPOSITIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention by and Leonard Weber, Northridge, Calif.

Filed Sept. 28, 1973, Ser. No. 401,921
Int. Cl.² C06D *5/08*
U.S. Cl. 149—36 **7 Claims**

1. A stabilized composition compatible with high-strength steel surfaces consisting essentially of a hydrazine containing material selected from the group consisting of substantially anhydrous hydrazine, unsymmetrical dimethyl hydrazine, and mixtures thereof, said material containing acidic impurities, and a minor amount of potassium hydroxide at least sufficient to neutralize said impurities.

3,919,015
GELLED WATER-BEARING EXPLOSIVE AND PROCESS

Frederick Bolza, Hawthorn East, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Aug. 13, 1973, Ser. No. 387,615
Claims priority, application Australia, Sept. 7, 1972, 359/72
Int. Cl.² G06B *33/06*
U.S. Cl. 149—42 **14 Claims**

1. In the process for gelling water-bearing explosive compositions containing gum selected from the group consisting of galactomannans and xanthans with crosslinking agents in situ, the improvement which comprises incorporating in the reaction mixture crosslinking agent selected from at least one of the group consisting of the compounds of elements of atomic number 58 to 60 inclusive and 62 to 71 inclusive, said cross-

linking agent being soluble in the system and being present in an amount from 0.002 to 2.5 millimoles per gram of gum, said gelation being conducted at a pH from 3 to 8.

3,919,016

THICKENING OF SOLVENT EXPLOSIVES SYSTEMS

Paul L. Dubrow, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed June 21, 1974, Ser. No. 481,717
Int. Cl.² C06B *31/30*
U.S. Cl. 149—60 **5 Claims**

1. A process for the thickening of hydrocarbon oil slurries of ammonium nitrate explosives which comprises the steps of:

A. Adding to a hydrocarbon oil slurry of ammonium nitrate a latex containing a polymer selected from the group consisting of cis-1-4-polyisoprene and polyisobutylene to provide a polymer concentration in the hydrocarbon oil slurry of NH_4NO_3 from .01 to 20% by weight; and then,

B. Inverting said latex containing the polymer into the hydrocarbon oil slurry of ammonium nitrate by means of an oil soluble surfactant having a high hydrophile-lipophile balance value whereby the polymer contained within the latex is solubilized and the hydrocarbon oil slurry of ammonium nitrate is thickened.

3,919,017

POLYISOCYANATE:FORMALDEHYDE BINDER SYSTEM FOR CELLULOSIC MATERIALS

Philip D. Shoemaker, Baker, and Hobert O. McQueary, Sweet Home, both of Oreg., assignors to Ellingson Timber Company, Baker, Oreg.

Filed Oct. 5, 1973, Ser. No. 404,026
Int. Cl.² B29J *5/00;* **B32B** *21/02;* **C09J** *5/04*
U.S. Cl. 156—62.2 **18 Claims**

1. A method for joining together bodies of cellulosic material, comprising

providing a plurality of said bodies,

coating said plurality with a composition, containing an organic polyisocyanate compound having at least 2 active isocyanate groups per molecule

coating said plurality with formaldehyde, and

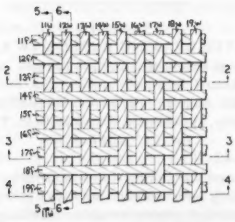
bringing said bodies into pressure contact and maintaining said contact at an elevated temperature for a time sufficient to form a permanent bond between the bodies.

3,919,018

REINFORCEMENT OF RUBBER

Charles F. Schroeder, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 142,663, May 12, 1971, Pat. No. 3,855,678, which is a division of Ser. No. 777,817, Nov. 21, 1968, abandoned. This application Apr. 5, 1973, Ser. No. 348,428
Int. Cl.² D03D *1/02, 13/00*
U.S. Cl. 156—85 **9 Claims**



1. A method of producing a sheet good adapted for reinforcement of rubber products, said method comprising:

weaving a fabric of (1) strands of a first material which exhibits shrinkage on exposure to a stimulus and (2) strands of a second material which does not exhibit shrinkage on exposure to the same stimulus, said weaving being performed in such preselected manner as to produce a pattern of weave characterized in that the strands of said second material exhibit a frequency of ups and downs or sinuosity which is greater than the frequency of ups and downs or sinuosity of the said strands of said first material, whereby strands formed of said second material are longer per given length of woven fabric than the strands of said first material,

embedding said woven fabric completely interiorly of a vulcanizable elastomeric matrix to thereby form a nonporous composite sheet good and

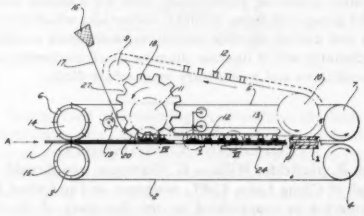
exposing said composite sheet good to a stimulus selected to cause shrinkage of said strands of said first material whereby said strands of said second material become more convoluted in configuration, thereby providing increased securement of said fabric with said elastomeric matrix.

3,919,019

METHOD OF HEAT-SEALING SUPERIMPOSED LAYERS OF SHEET MATERIAL

Winfried Bottcher, Leipzig, Germany, assignor to Veb Polygraph Leipzig Kombinat Fuwe Polygraphische Maschinen und Ausruestungen, Liepzig, Germany

Continuation-in-part of Ser. No. 164,307, July 20, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,070
Int. Cl.² B32B *7/08*
U.S. Cl. 156—91 **4 Claims**



1. A method of thread-sealing superimposed layers of sheet material which advance continuously in a path, comprising the steps of continuously advancing a stack of superimposed sheet material in a straight-line path; withdrawing a heat-sealable thread from a supply; severing a length of thread from said heat-sealable thread at a location spaced from said path; moving the severed length of thread in stretched condition to and in direction lengthwise of said path and of the direction of advancement of said stack; placing the stretched length of thread onto and pressing it against one major side of the advancing stack so that it moves with the same; pushing spaced end portions of said length of thread through said stack so as to project in part from the opposite major side thereof; deflecting the projecting parts into engagement with said opposite major side; and heat-sealing each of said projecting parts directly to said opposite major side of said stack during the continuous advancement of said stack in said path.

3,919,020

METHOD OF RETREADING A TIRE

James E. Floto, Akron Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 19, 1974, Ser. No. 489,960
Int. Cl.² B29H *5/04, 5/16, 17/36*
U.S. Cl. 156—95 **19 Claims**

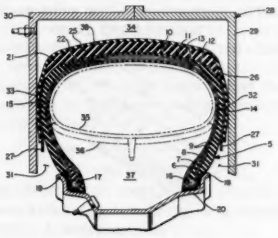
1. A method of forming a tread on a tire comprising:

a. placing a sufficient amount of unvulcanized rubbery material on the outer periphery of the tire to at least form a new tread;

b. covering the unvulcanized rubbery material with an elas-

tic membrane having a smooth inner surface for contacting the unvulcanized rubbery material, the surface being free of any ridge large enough to mold a desired groove in the vulcanized tread of the tire;

c. contacting the membrane with a heated fluid, under pressure, to compress the unvulcanized rubbery material against the outer periphery of the tire, and heat and vulcanize the compressed material such that the outer surface of the material, when vulcanized, is generally smooth; and



d. grooving the smooth periphery of the material when it is vulcanized, to form a pattern of ribs and grooves in the newly formed tread.

3,919,021

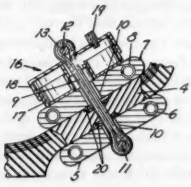
METHOD OF REPAIRING TIRE CASINGS

Benjamin Whittle, Rte. 3, Paw Paw, Mich. 49079

Division of Ser. No. 790,198, Jan. 10, 1969, Pat. No. 3,577,592. This application Feb. 17, 1971, Ser. No. 116,120

Int. Cl.[2] B29H *5/16;* **B60C** *21/02, 21/06*

U.S. Cl. 156—97 **5 Claims**



1. The method of patching a break in a tire casing which comprises the steps of

filling the break with plug rubber between the inner and the outer surfaces of the casing,

retaining the plug rubber in the break by inner and outer mold members having their edges lapped over undamaged and unaltered portions of the inner and outer surfaces of the casing,

holding said mold members in rubber retaining position by means of a tensile strand passed through the central portion of the break and embedded in said plug rubber and connected at its ends to the mold members,

curing the plug rubber while so held by said mold members, removing said mold members but leaving said tensile strand embedded in said plug rubber when cured,

cutting away the exposed inner portion of said strand after said mold members are removed,

and applying a load carrying patch over the inner side of said plug rubber and the inner end of the embedded portion of said strand and the adjacent area of the inside of said casing,

said tensile strand being relatively thin and narrow as compared to its length and being relatively laterally flexible and bendable but relatively longitudinally inextensible.

3,919,022

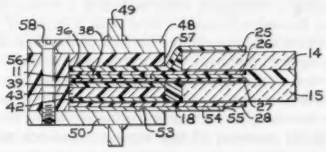
WINDOW PANEL EDGE CONSTRUCTION

John E. Stefanik, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,440

Int. Cl.[2] B32B *17/10, 31/20*

U.S. Cl. 156—104 **3 Claims**



1. A method of making a window panel assembly which comprises supporting at least one rigid transparent sheet with its marginal major surface and edge portions spaced away from the perimeter boundaries of each molding surface of a molding-pressing frame, said molding-pressing frame having a given molding surface with the same contour as the contour of the supporting structure on which the window panel assembly is to be installed and said sheet having marginal major surface portions thereof that are out of contour with the adjacent contour of said given molding surface of said molding-pressing frame, applying an edge attachment member to said sheet which includes applying a pair of resin impregnated strap members in a pliable condition to said sheet with a first one of said strap members being adhered to the marginal major surface area on one side of said sheet and extending from its edge into said molding-pressing frame, the other of said strap members being adhered to the marginal major surface area on the other side of said sheet and extending outwardly into said molding-pressing frame, pressing the portions of said edge attachment member within said molding-pressing frame against said given molding surface of said molding-pressing frame, applying heat and pressure to said panel assembly and molding-pressing frame to bond said edge attachment member together and also to bond said strap members to said sheet and to cure the resin of said strap members, cooling said panel assembly and removing said panel assembly from said molding-pressing frame.

3,919,023

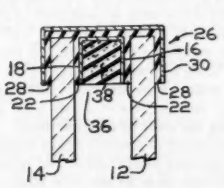
MULTIPLE GLAZED UNIT

George H. Bowser, New Kensington, and Renato J. Mazzoni, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 24, 1973, Ser. No. 400,111

Int. Cl.[2] B32B *17/00, 3/02;* **E06B** *3/24*

U.S. Cl. 156—107 **4 Claims**



1. A method of fabricating a multiple glazed unit having an interior airspace, comprising the steps of:

providing a spacer frame (1) having a desiccant material therein and (2) having the surfaces of the frame facing the interior of the airspace penetrable by moisture and the remaining surfaces of the frame moisture impervious;

providing a layer of moisture-resistant adhesive on opposed outer surfaces of the frame;

positioning a sheet of a rigid material on each side of the frame with the marginal edge portions of the sheets in contact with the moisture-resistant adhesive on the frame;

flowing the moisture-resistant adhesive between the opposed surfaces of the frame and adjacent marginal edge portions of the sheets to form a subassembly having a primary moisture-resistant seal;

providing a composite strip including a moisture-impervious, bendable-formable tape with a layer of moisture-resistant adhesive on one surface of the tape; and

applying the composite strip to the subassembly with (1) a portion of the adhesive of the strip intermediate the sides in adhesive contact with the peripheral edge portions of the sheets, spacer frame and adhesive of the primary seal and (2) portions of the adhesive on each side of the intermediate portion extending to and in adhesive contact with outer marginal edges of the rigid sheets.

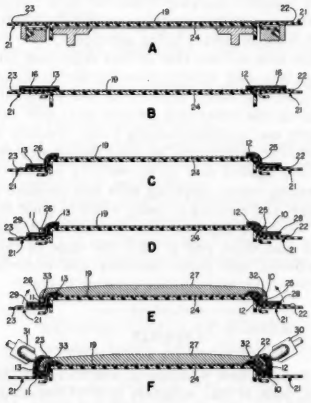
3,919,024
PNEUMATIC TIRE

Robert E. Gordon, Toronto, Canada, assignor to The Goodyear Tire & Rubber Company of Canada, Ltd., Toronto, Canada

Continuation of Ser. No. 84,672, Oct. 28, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,913

Int. Cl.[2] B29H *17/22, 17/26*

U.S. Cl. 156—123 **3 Claims**



1. A method of building a pneumatic tire, comprising the steps of:

a. wrapping an air-impervious innerlinner of rubber material around a cylindrical tire building drum at least once;

b. wrapping a trap strip around each of the opposing ends of the innerliner at least once, the width of each of the trap strips measured parallel to the longitudinal axis of the drum being narrow compared to the correspondingly measured width of the innerliner, the trap strips including rubberized reinforcement cords and at least partially overlapping the ends of the innerliner;

c. positioning a pair of annular beads around the trap strips intermediate opposing ends thereof and reversely turning the farthest spaced free ends of the trap strips at least partially around the beads to secure the beads to the innerliner;

d. wrapping a piece of cordless, unvulcanized rubber material around the innerliner between the beads, the material forming the tread, sidewalls and any carcass plies of the tire and being in contact with the innerliner and trap strips, the trap strips material and beads forming a cylindrically shaped unvulcanized tire;

e. removing the unvulcanized tire from the tire building drum;

f. torodially shaping the unvulcanized tire; and

g. molding and vulcanizing the torodially shaped tire.

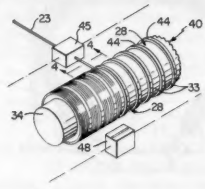
3,919,025
ENDLESS POWER TRANSMISSION BELT AND METHOD OF MAKING SAME

Robert L. Ray, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 314,058, Dec. 11, 1972, Pat. No. 3,847,029. This application Feb. 26, 1974, Ser. No. 446,045

Int. Cl.[2] B29D *29/00*

U.S. Cl. 156—141 **9 Claims**



1. A method of making endless power transmission belts comprising the steps of, providing a strip of a thermoplastic elastomer having integral side-by-side belt body elements, wrapping said strip about a building cylinder, heat fusing the ends of said strip together to define a sleeve having a heat-fused area, cooling said sleeve, and cutting said sleeve between each adjoining pair of elements to define a plurality of endless belts wherein each of said belts has a heat-fused area corresponding to the area of fusion when it comprised said sleeve, with the heat-fused area of each belt having physical properties which are substantially equal to the physical properties of the remainder of the belt, said providing step comprising providing said strip having an upwardly extending projection at each lateral side thereof and having a double-thickness structure between each adjoining pair of body elements, said heat-fusing step comprising heat fusing opposed ends of said lateral side projections and said double-thickness structures to define said sleeve having a pair of annular projections at opposite lateral sides thereof and having an annular double-thickness structure between each adjoining pair of elements, and said cutting step comprising bisecting each of said annular double-thickness structures to define an associated pair of projections and cutting the sleeve beneath the annular structures to define said plurality of endless belts each having an integral pair of upwardly extending spaced projections arranged at opposite lateral sides thereof.

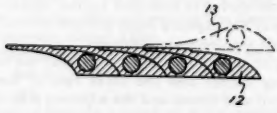
3,919,026
FLEXIBLE HOSE MANUFACTURING PROCESS

Tadashi Mizutani, Osaka, and Soshiro Ono, Fuwa, both of Japan, assignors to Kuraray Plastics Company, Limited, Osaka, Japan

Continuation of Ser. No. 191,760, Oct. 22, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,603

Int. Cl. B29d *23/12*

U.S. Cl. 156—143 **13 Claims**



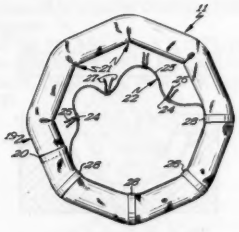
1. Method of making spirally reinforced flexible tubular hose utilizing forming machines of the type wherein an annu-

lar array of rolls defines a winding mandrel, the improvement comprising the steps of extruding a composite strip of synthetic plastic materials while in a plastic condition comprising an exterior body of soft resilient synthetic plastic material and an embedded reinforcing body of synthetic plastic material having a composition different from that of the exterior body, the transverse cross-section of the extruded strip being defined by a flat base surface having a thickened apex portion disposed medially of the extremities of the flat surface, the apex portion having outwardly downwardly sloping opposing surfaces which meet with the respective extremities of said flat surface spirally winding said extruded strip on said mandrel with each successive turn overlapping a previous turn to fusion bond a substantial area of the flat surface of each turn to the thickened apex portion of a previous turn and also deforming the cross-section of the strip to an extent that the unbonded flat surfaces define a continuously smooth interior surface of the completed hose.

3,919,027
METHOD OF MAKING INFLATABLE LIFE RAFT

Walter C. Jones, Armstrong, Iowa, assignor to Rubber Dynamics Corporation, Armstrong, Iowa

Filed Apr. 25, 1974, Ser. No. 464,204
Int. Cl.² A63B *39/00*
U.S. Cl. 156—145 **2 Claims**



1. A method of making an inflatable life raft comprised of an inflatable tubular annular member and a bottom member, said method including:

forming the inflatable annular member from a single elongate rectangular blank of gas-impervious flexible, yieldable resilient material,

measuring, locating and marking a plurality of longitudinally spaced apart generally diamond-shaped fold areas on said blank, said fold areas being of identical size and shape and being equally spaced apart,

cutting said blank along its longitudinal center line to form the blank into a pair of identical panels,

securing each longitudinal edge of one panel to a longitudinal edge of the other panel in sealing relation to form the panels into a tube, the marked fold areas of the tube being disposed exteriorly,

securing the ends of the tube together in lapped sealed relation to form the tube into an annular hollow member, said fold areas being disposed along the inner external peripheral surface of the annular member,

folding the fold areas inwardly, each fold area including inwardly extending fold surfaces,

securing an elongate narrow fold-engaging tape to the inner external peripheral surface of the annular member, said fold-engaging tape having a plurality of longitudinally spaced apart U-shaped fold engaging elements secured thereto, the spacing between the fold engaging elements corresponding to the spacing between said fold areas, said fold-engaging elements having the same width dimension as the fold-engaging tape, each fold-engaging element extending into each fold area and being secured to the fold surfaces thereof to retain each fold in inwardly folded relation, said fold-engaging tape extending throughout the entire peripheral surface of said annular member,

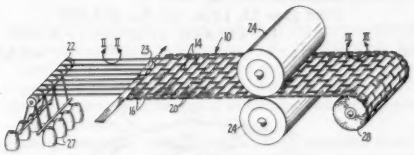
applying a plurality of spaced apart narrow cover tapes to the annular member, each cover tape having a width dimension corresponding to the width dimension of the fold-engaging tape, each tape encircling said annular member at one of said folds to cover the transverse inward fold line defined by the fold whereby said annular member when inflated defines a polygon, each side of which extends between adjacent folds,

securing a flexible water impervious bottom member to said annular member in sealed relation therewith.

3,919,028
METHOD OF MAKING UNIDIRECTIONAL WEBBING MATERIAL

Albert Lewis, Covina, and Ronald G. Krueger, Azusa, both of Calif., assignors to Kaiser Glass Fiber Corporation, Oakland, Calif.

Filed Sept. 13, 1972, Ser. No. 288,793
Int. Cl.² D03D *13/00*
U.S. Cl. 156—148 **4 Claims**



1. A method of manufacturing unidirectional glass fiber webbing having a low warp to fill weight ratio, said method comprising loosely weaving weft bundles of glass fiber rovings comprised of uncoated fine glass fiber fill elements in retiform construction in a fill to warp weight ratio of 90% or more with multi-filament synthetic fiber warp strands spaced from one another by about one-half inch and coated with a substantially uniform blockable coating having a thickness of 0.002 to 0.004 inches, said coating being thermoplastic and selected from the group consisting of vinyl chloride, vinyl acetate and vinyl pyrrolidene polymers, and thereafter holding the woven elements and strands in engagement with one another while elevating the temperature of the coating to activate the coating and bond the fill elements and warp strands together therethrough.

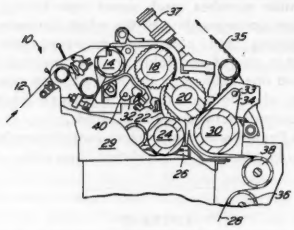
3,919,029
QUIET SINGLE FACER MACHINE

John H. Osgood, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Sept. 4, 1973, Ser. No. 393,858
Int. Cl.² B31F *1/28*
U.S. Cl. 156—205 **8 Claims**

1. A method of reducing noise level of operation of a single facer machine wherein the flutes of rotating first and second corrugating rolls are in meshing engagement and have a corrugating medium therebetween, locating the second corrugating roll so that its periphery is juxtaposed to the periphery of a rotating pressure roll with a nip therebetween comprising skewing the pressure roll and first corrugating roll longitudinal axes with respect to the longitudinal axis of said second corrugating roll, forming the flutes on said first corrugating roll such that they are skewed with respect to the longitudinal axis of said first corrugating roll by said skew angle, forming the flutes on said second corrugating roll such that they are parallel to

the longitudinal axis thereof, and corrugating a medium between flutes on said corrugating rolls by mating flute surfaces



on said corrugating rolls such that the flutes are parallel to each other.

3,919,030

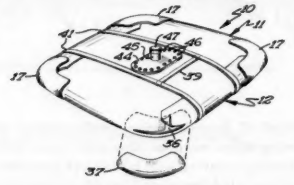
ELASTIC STORAGE TANK AND METHOD FOR MAKING THE SAME

Walter C. Jones, Armstrong, Iowa, assignor to Rubber Dynamics Corporation, Armstrong, Iowa

Filed June 12, 1974, Ser. No. 478,738

Int. Cl.[2] A45C *11/00*

U.S. Cl. 156—211 **4 Claims**



1. A method of making an elastic storage tank for fluid and fluid-like material, comprising:

cutting a pair of generally rectangular shaped blanks from a sheet of impervious, fiber-reinforced elastomer, each blank having substantially straight longitudinal edges and transverse edges,

folding each blank along a fold line disposed substantially parallel to the longitudinal edges of the blank to form the blank into a pair of large panels, one of said panels having a greater length than the other panel,

folding said larger panel of each blank along a pair of spaced apart substantially parallel transverse fold lines, each transverse fold line being located adjacent one end of the larger panel, to thereby define a pair of end panels at opposite ends of said larger panel,

the smaller of said larger panels of each blank having a pair of triangular shaped flaps, each extending longitudinally therefrom adjacent the fold line between said larger panels, said end panels each having a generally triangular shaped flap which projects transversely of each blank, but longitudinally from the end panel and generally in a direction towards one of the triangular flaps on the smaller of said larger panels, the larger panel of each blank having a pair of arcuate edge portions, each being located between the flap on one of the end panels and a flap on the smaller of the large panels,

folding edge portions of the triangular shaped flap on an end panel in lapped relation with an edge portion on a triangular shaped flap of one of the smaller of said large panels, securing said lapped edge portions together in sealing relation,

securing edge portions of the end panels to the edge portions of the smaller of the larger panels,

applying a pair of formed arcuate attachment members each to an arcuate edge portion of the larger panel and to the folded flaps of an end panel in the other large panel to thereby form an arcuate corner portion, and to thereby complete the formation of each blank into an end tank section, each end tank section having an open end with a continuous peripheral edge defined by certain edges of the end panels and large panels,

interconnecting the peripheral edge of an open end of one end tank section with the peripheral edge of an open end of the other end tank section and sealingly joining the two tank sections by the use of a connecting medium to thereby form the completed elastic tank.

3,919,031

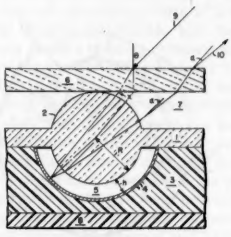
RETROREFLECTIVE FILM

Michael L. White, Morrisville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 460,638, April 12, 1974, which is a continuation-in-part of Ser. No. 238,046, March 17, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,535

Int. Cl.[2] B31F *1/00*

U.S. Cl. 156—219 **6 Claims**



2. A method for forming a retroreflective film comprising embossing the first film with hemispherical depressions on one surface thereof, vacuum metallizing said embossed surface of said first film, embossing a second optically transparent film with substantially hemispherical projections from the surface thereof, wherein said projections have an identical center-to-center spacing, but a smaller radius than that of the hemispherical depressions of the first film, arranging the substantially hemispherical projections of the second film concentrically with the hemispherical depressions of the first film, with means laminating said film layers whereby no optical distortion is created.

3,919,032

METHOD OF MAKING STRIPS OF CHANCE TICKETS

Nathan M. Greenbarg, Butler, Pa., assignor to Joseph Diego, Pittsburgh, Pa. part interest

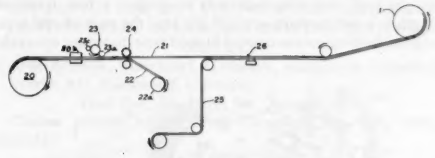
Continuation-in-part of Ser. No. 878,285, Nov. 20, 1969, abandoned, and a continuation-in-part of Ser. No. 213,845, Dec. 29, 1971. This application Jan. 28, 1974, Ser. No. 437,056

Int. Cl.[2] B32B *31/18*

U.S. Cl. 156—252 **1 Claim**

1. The method of making chance tickets in strip form, comprising forming a base sheet comprising a plurality of longitudinal strip base portions integrally secured together along their side edges and having transverse perforations and relatively large holes between tickets to provide semi-circular cut-outs on longitudinal adjoining tickets, imprinting random numbers along the longitudinal central portions of said strip base portions, perforating a separate corresponding covering sheet inwardly of the longitudinal edges of covering strip

portions, corresponding to the strip base portions, along continuous lines on both sides of the centers of said covering strip portions while said covering sheet is lightly adhered to a carrier strip, thereafter removing said carrier strip and adhering the perforated covering strip portions only along the longitudinal edges of said base strip portions so as to cover, without



adherence, said longitudinal central portions, said transverse perforations and said relatively large holes, and finally slitting the various longitudinal strip base portions and adhered corresponding covering strip portions through their longitudinal edges into separate ticket strips and wrapping said strips in roll form.

3,919,033
FABRIC BONDING PROCESS UTILIZING POWDERED INTERPOLYAMIDES

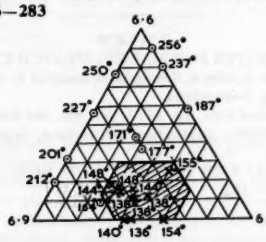
Wendy Rawstron Gill, and John Norbury, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 119,610, March 1, 1971, abandoned. This application May 1, 1973, Ser. No. 356,170

Claims priority, application United Kingdom, Mar. 12, 1970, 11931/70

Int. Cl.[2] C09J *5/06*; **B32B** *27/34*, *5/30*

U.S. Cl. 156—283 **3 Claims**



1. A fabric bonding process comprising applying to a fabric surface an interpolyamide in the form of a finely divided powder consisting essentially of hexamethyleneazeleamide units in a proportion of 20–62% by weight, ϵ-amino-caprioc acid units in a proportion of 25–65% by weight and hexamethylene adipamide units in a proportion of 0–30% by weight, the proportion of the units being such that the softening point range of the polyamide determined by the ball and ring technique using an oil bath heating rate of 4° to 5°C per minute is between 120° and 160°C, bringing said surface into contact with a second fabric surface and applying heat to soften the polyamide.

3,919,034
JOINING PLASTIC ELEMENTS

Piertommaso Carini, Sondrio, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 5, 1974, Ser. No. 448,442

Int. Cl.[2] B29C *19/00*

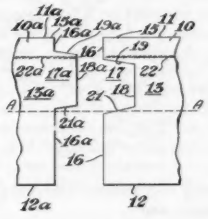
U.S. Cl. 156—304 **6 Claims**

1. A method for the butt welding of two elongate synthetic resinous thermoplastic foam elements having a longitudinal axis, the method comprising

providing a first foam element having an end to be joined and a second foam element having an end to be joined,

forming on the end of the first foam element a recess extending inwardly and generally axially and laterally, the elongate element

forming on the end of the second element to be joined a protuberance having one surface adapted to mate with at least one surface of the recess, the mating surfaces extending generally transverse to the longitudinal axis of the elements, the protuberance extending outwardly in an axial direction for a distance less than the depth of the recess, the protuberance being of a sufficient size to prevent mating of the surfaces of the protuberance and the recess, subsequently



heating a portion of an end surface of the second elongate member sufficient to heat plastify the thermoplastic foam and cause collapse of a portion thereof sufficient to deform the protuberance to mate with the recess,

abutting the ends to be joined of the first and second members, thereby

cooling at least a portion of the heat plastified foam in contact with the end to be joined of the first member, thereby

adhering the first and second members together.

3,919,035
METHOD OF BONDING STYRENE-BUTADIENE BLOCK COPOLYMERS TO OTHER SURFACES

Wolfgang Warrach, Willowdale, Canada, assignor to Stein, Hall, Limited, Jeffersontown, Ky.

Filed Oct. 10, 1973, Ser. No. 404,967

Int. Cl.[2] B32B *31/12*, *25/14*; **A43B** *13/32*

U.S. Cl. 156—315 **10 Claims**

1. A method of bonding a styrene-butadiene block copolymer thermoplastic rubber composition to a surface which comprises:

A. coating the block copolymer thermoplastic rubber composition and the other surface with a primer;

B. applying an adhesive to the coated surfaces, and

C. pressing the surfaces together at a pressure and for a time sufficient to obtain adequate adhesion,

wherein the primer is comprised of an organic solvent solution of a graft copolymer of a styrene-butadiene block copolymer thermoplastic rubber and an alkyl methacrylate having 1 to 4 carbon atoms in the alkyl group and wherein the graft copolymer contains about 30 to 90% by weight block copolymer and 70 to 10% by weight alkyl methacrylate.

3,919,036
INTERCHANGEABLE PRINT AND LABEL INSERTION APPARATUS FOR CONVEYOR SYSTEM

Fred Reinhart, Costa Mesa, and Edwin C. Bolton, La Habra, both of Calif., assignors to Dolco Packaging Corporation, Burbank, Calif.

Filed May 16, 1974, Ser. No. 470,694

Int. Cl.[2] B41L *3/12*

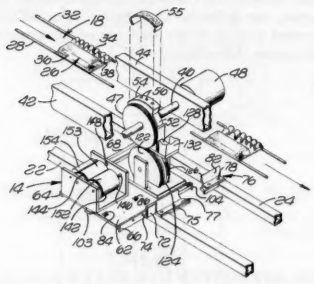
U.S. Cl. 156—384 **7 Claims**

1. Apparatus for interchangeably inserting print and label insertion equipment, in a conveyor type system comprising:

a conveyor system for transporting a package along the conveyor axis;

interchangeable print and label insertion equipment slidably mounted along a second axis perpendicular to said conveyor axis;

a frame member for securing a drive member to said conveyor system, said drive member containing a shaft rotatable therewith;



a support having said slidably interchangeable equipment secured thereto; and

means alternately interconnecting said drive member to said interchangeable equipment, comprising a first gear and a second gear each operatively associated with different interchangeable equipment on said support and engageable with said drive member.

3,919,037

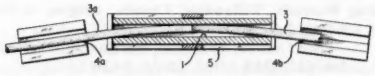
OPTICAL FIBER SPLICING APPARATUS

Calvin Max Miller, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 7, 1974, Ser. No. 521,656

Int. Cl.² B65H *69/06*

U.S. Cl. 156—502 **5 Claims**



1. An apparatus for abutting a mating pair of optical fibers comprising:

an elongated optical fiber receiving cavity which is continuous with respect to either end, having a circumference slightly larger than that of said fibers,

means for inserting in the same plane of travel respective ones of said mating pair of optical fibers into opposing ends of said receiving cavity,

means for adjusting the fiber-to-cavity wall separation so that said fibers are biased against and lodged along said cavity wall, and

means for further inserting said fibers into said cavity so that said fiber ends are brought into axial alignment and abutment.

3,919,038

APPARATUS FOR ATTACHING MEMBERS TO ARTICLES

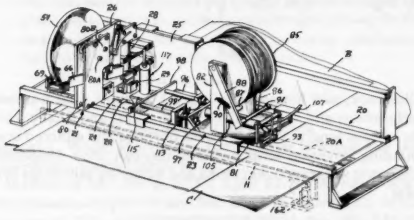
Robert F. Davis, Weybosset Ave., Framingham, Mass. 01701

Filed Oct. 27, 1972, Ser. No. 301,474

Int. Cl.² B31B *1/90*

U.S. Cl. 156—511 **10 Claims**

1. Apparatus for attaching a member to an article when in a predetermined position, said apparatus comprising a support extending at least part way across said position, a pressure sensitive tape dispenser attached to said support and including a head reciprocable between a first position spaced from said predetermined position and a second position in which it is operable to press a severed length of such tape against an article in that position, a member dispenser including a reel for a long length of flexible, member-forming material, and reciprocable feed means operable to withdraw predetermined lengths of said material from said reel along a substantially straight path and simultaneously to project a free terminal length in a substantially straight line into the path of said tape lengths, holding means carried by said tape dispenser operable



to releasably hold said projected length spaced from an article in said predetermined position, said member dispenser also including cutting means between the feed means and said tape dispenser and in the path of the projected material and operable to cut free said projected terminal length and control means to operate said member dispenser whenever the tape dispenser is operated to effect the replacement of the tape length then secured to an article and attaching the member thereto, and means to operate said cutting means while the member is held above the article.

3,919,039

APPARATUS FOR MAKING SWATCH CARDS

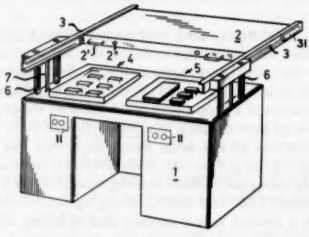
Hans Rohner, Kuttigen, Switzerland, assignor to Polytex A.G., Glattbrugg, Switzerland

Filed Sept. 10, 1973, Ser. No. 396,048

Claims priority, application Switzerland, Sept. 12, 1972, 013367/72

Int. Cl.² B30B *9/04*; B32B *31/00*; B05C *17/04*

U.S. Cl. 156—562 **10 Claims**



1. An apparatus for assembling swatch sample cards comprising:

a housing having a generally horizontal table;

a fixed gluing station at one side of said table having a support for a card;

means for applying adhesive to a card at said gluing station;

a fixed attachment station on said table adjacent said gluing station and having a support for at least one stack of swatches;

a horizontal guide on said housing;

a platen slidable on said guide between a forward position overlying and spanning said stations and a back position giving access to said stations; and

means for vertically displacing said platen in said forward position down toward said stations for pressing an unglued card into said gluing station and thereby applying glue thereto and for pressing a glued card down onto said stack of swatches.

3,919,040

APPARATUS FOR APPLYING GUMMED LABELS TO CONTINUOUSLY ADVANCING BOTTLES OR OTHER OBJECTS

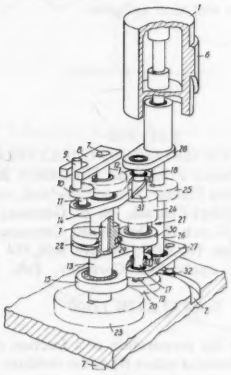
Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Dec. 20, 1973, Ser. No. 426,995

Claims priority, application Germany, Dec. 29, 1972, 2263947

Int. Cl.[2] B65C *9/30*

U.S. Cl. 156—571 **1 Claim**



1. In an apparatus for the application of gummed labels to continuously advancing bottles or other objects, comprising a rotating or oscillating glue-bearing pickup member, a continuously revolving glue applicator cylinder, a stationary stack of labels, and a continuously revolving gripper or vacuum cylinder, the improvement which comprises means for continuously advancing said pickup member along an endless path whereby it follows the configuration of and successively contacts the glue cylinder, the label stack and the gripper cylinder while assuming their peripheral speeds within the area of contact, said means including a drive for the pickup member comprising a driving shaft, an intermediate shaft and a driven shaft, said driven shaft carrying the pickup member, a first arm linking the driving shaft and the intermediate shaft, a second arm linking the intermediate shaft and the driven shaft, a first cam about said driving shaft, a stationary gun gear about said driving shaft, a first cam follower carried on said intermediate shaft, a planetary gear on said intermediate shaft rotated therewith and meshing with said sun gear, whereby rotation of said driving shaft through said first arm causes said intermediate shaft to rotate about said driving shaft, engagement of the first cam follower with the first cam causing the follower to move up and down, a first gear on said intermediate shaft connected to said first cam follower so as to move up and down therewith, an inclined track connecting said first gear and said intermediate shaft, whereby upward movement of said first gear in response to the first cam configuration is transformed into rotational movement of said first gear in one direction and downward movement to opposite rotational movement, a second gear on said driven shaft driven by said first gear and causing said pickup member to rotate in one or the opposite direction in dependence upon the first cam configuration, a second cam generally surrounding said driving, intermediate and driven shafts, and a second cam follower on said second arm, whereby said second cam follower causes said driven shaft and pickup member to follow a closed rotary path while said pickup member is additionally caused to rotate more or less by the interengagement of said second and first gears, said first gear and inclined track and said first cam follower and first cam.

3,919,041

MULTI-STAGE CHLORINE DIOXIDE DELIGNIFICATION OF WOOD PULP

Harry D. Wilder, Midlothian, Va., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 193,220, Oct. 27, 1971, abandoned, which is a continuation of Ser. No. 889,662, Dec. 31, 1969, abandoned, and a continuation-in-part of Ser. No. 121,574, March 5, 1971, abandoned, said Ser. No. 889,662, is a continuation-in-part of Ser. No. 797,209, Feb. 6, 1969, Pat. No. 3,591,451, said Ser. No. 121,574, is a division of Ser. No. 797,209,. This application Nov. 24, 1972, Ser. No. 309,601The portion of the term of this patent subsequent to July 6, 1988, has been disclaimed.

Int. Cl.[2] D21B *1/16;* D21C *9/14*

U.S. Cl. 162—25 **7 Claims**

1. In the process of producing from wood a paper-making pulp having a yield of from about 55 to about 85% using a preliminary partial digestion followed by refining and then delignification with ClO_2, the improvement comprising refining the partially digested wood in a high pressure refiner at a temperature above 212°F, and subjecting the refined material to a delignifying-bleaching sequence of three oxidizing treatments with preformed ClO_2 alternating with two caustic extraction treatments to bring the brightness of the pulp up to at least about 80% G.E., the amount of chlorine dioxide in each of the chlorine dioxide stages being progressively smaller, and the total amount of chlorine dioxide used being not more than about 9% based on the dry weight of the original wood.

3,919,042

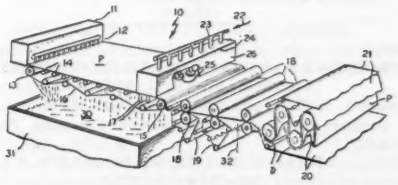
METHOD AND APPARATUS FOR APPLYING DRY STARCH PARTICLES TO WATER WET CELLULOSIC WEBS USING ELECTROSTATIC ATTRACTION

Lester L. Spiller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corporation, Indianapolis, Ind.

Filed Jan. 5, 1967, Ser. No. 607,418

Int. Cl.[2] D21H *3/00*

U.S. Cl. 162—175 **26 Claims**



1. A method of manufacturing a fibrous, absorbent, cellulosic sheet material, the steps comprising forming a water-wet web containing at least 25% by weight of water of fibrous cellulosic sheet material, depositing dry particles of starch upon said wet web by advancing said wet web past a particle deposition zone and supplying to said particle deposition zone said dry particles of starch electrostatically charged for mutual repulsion whereby said starch particles will be electrostatically attracted to and uniformly deposited upon said wet web in the form of separated particles and in amounts sufficient to be

capable of causing selective modification of surface properties of the sheet material, and then dewatering said web.

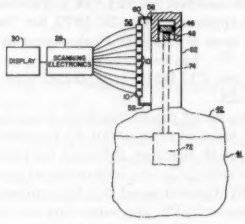
25. In a paper-making machine the improvement which comprises means for advancing a wet paper web past a particle deposition zone, means for supplying to said particle deposition zone electrostatically charged particles of starch whereby such charged particles will be attracted to said paper web in the form of separate particles and uniformly deposited thereon.

3,919,043

DIGITAL NUCLEAR REACTOR CONTROL ROD POSITION INDICTION SYSTEM

James B. Reid, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1973, Ser. No. 407,339
Int. Cl. G21c *17/12*
U.S. Cl. 176—19 R **7 Claims**



1. A digital nuclear reactor control rod position indication system for indicating the position of an elongated movable control drive rod having one degree of freedom along its longitudinal axis within a control rod drive housing which extends longitudinally outward from the reactor vessel enclosure, comprising:

a magnetized member forming a portion of the control drive rod;

a plurality of Hall Effect transducers spaced at predetermined intervals in a tandem array longitudinally extending along an axis parallel to the axis of the control rod drive housing within proximity to the external perimeter of the housing, said transducers respectively providing an output when in proximity to said magnetized member to an extent to be under substantial influence of its magnetic field;

means for multiplexing the transducers outputs; and

means for displaying said multiplexed outputs in digital form to provide an indication of the position of the control rod within the reactor vessel.

3,919,044

PROCESSES FOR CONCENTRATING AND PURIFYING VIRUSES AND VIRAL ANTIGENS

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Mar. 28, 1973, Ser. No. 345,570
Int. Cl.² A61K *39/12*
U.S. Cl. 195—1.5 **5 Claims**

1. A method of purifying and concentrating acid-resistant viruses and viral antigens for vaccination from an initial stock solution containing acid-resistant virus and viral antigens and non-viral proteins which, upon vaccination will sensitize and otherwise cause untoward allergic reactions, said method comprising:

a. treating said stock solution with 0.01 percent alkyldimethylbenzyl ammonium chloride to precipitate from said solution said non-viral proteins which fall out of solution in an acid pH range;

b. filtering said treated solution through a coarse clarifier to remove the precipitated proteins therefrom;

c. adjusting the pH of said clarified solution to 8–9 to prevent virus from adsorbing to resins;

d. filtering said pH 8–9 clarified solution through a cationic resin exchanger to remove any remaining non-viral proteins from said solution and provide a resin filtrate;

e. adjusting the pH of said resin filtrate to 3–6 to enhance virus adsorption to a membrane;

f. filtering said acidified resin filtrate through a 142 mm - 0.45 micron reactive membrane, formed of a material selected from the group consisting of nitrocellulose, epoxy-fiberglass, asbestos, cellulose, triacetate polymers, fiberglass, or reactive textiles, to concentrate the virus on said membrane;

g. washing said membrane with a buffer having a pH 3–9 to remove all residual non-viral proteins therefrom;

h. treating said washed membrane with glycine eluent at pH 10–12 to elute the virus from said membrane; and

i. collecting said eluate which consists of purified and concentrated virus and viral antigens.

3,919,045

PROCESS FOR OBTAINING CHOLESTEROL

Carl H. Krauch, Neuss; Frank Hill, Dusseldorf; Rudolf Lehmann, Neuss; Hans Pfeiffer, Haan Rhineland, and Joachim Schindler, Dusseldorf-Benrath, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Feb. 10, 1975, Ser. No. 548,354
Claims priority, application Germany, Feb. 23, 1974, 2408752
Int. Cl.² C12D *13/00*
U.S. Cl. 195—3 **14 Claims**

1. A process for the preparation of a fraction enriched in cholesterol or cholesterol esters from the residues of the processing of fats comprising emulsifying said residues in an aqueous culture medium, culturing said emulsified residues with a micro-organism selected from the group consisting of the species *Norcardia paraffinica*, *Nocardia salmonicolor*, *Nocardia opaca*, *Candida lipolytica*, and *Corynebacterium petrophilum* at a temperature of 25°C to 55°C and a pH value of 4.0 to 8.0 for a time sufficient to produce the fraction enriched in sterols, separating said enriched sterols fraction from said culture medium by solvent extraction, and recovering said cholesterol or cholesterol esters.

3,919,046

METHOD OF PRODUCING D-RIBOSE

Ken-ichi Sasajima, Hyogo, and Masahiko Yoneda, Kobe, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 370,759, June 18, 1973, abandoned. This application Nov. 14, 1973, Ser. No. 415,561
Claims priority, application Japan, June 17, 1972, 47-60612
Int. Cl.² C12D *13/02*
U.S. Cl. 195—30 **11 Claims**

1. A method of producing D-ribose, which comprises cultivating a microorganism belonging to the genus Bacillus in a culture medium containing assimilable carbon and nitrogen sources and factors which are necessary for growth of the microorganisms, causing said microorganism to elaborate and accumulate D-ribose, and recovering the D-ribose thus accumulated from the resultant culture broth, the transketolase activity of the microorganism being less than 0.001 μ mole/min./mg. protein.

3,919,047
MICROBIOLOGICAL HYDROXYLATION OF 2,6-METHANO-3-BENZAZOCINES

Hans-Jörg Vidic, and Klaus Kieslich, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

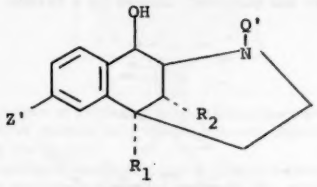
Filed July 26, 1974, Ser. No. 492,233

Claims priority, application Germany, July 26, 1973, 2338360

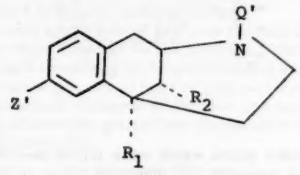
Int. Cl.² C12D *13/02*

U.S. Cl. 195—51 R **6 Claims**

1. A process for the production of compounds of the formula



wherein Q' is benzoyl; R_1 and R_2 each is a hydrogen atom or lower alkyl and Z' is a free, etherified, or esterified hydroxy group, which comprises subjecting a compound of the formula



wherein Q', R_1, R_2, and Z' have the values given above to the hydroxylating activity of a hydroxylating species of the microorganism Pellicularia filamentosa.

3,919,048
INSOLUBLE CARRIER-BOUND ENZYMES

Johannes J. Dahlmans, Maastricht, and Theo A. J. Meijerink, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 8, 1974, Ser. No. 459,236

Claims priority, application Netherlands, Apr. 10, 1973, 7304956

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **8 Claims**

1. An insoluble enzyme complex comprising a natural sponge, an aquatic animal of the invertebrate phylum Porifera having a porous skeleton of horny skeletal fibers and containing spongin, which consists mainly of protein, to which is chemically bonded an enzyme.

3,919,049
PROCESS FOR PREPARING β-GALACTOSIDASE

Akira Kiuchi, Kawaguchi, and Yuji Tanaka, Tokyo, both of Japan, assignors to Tokyo Tanabe Co., Ltd., Japan

Filed June 27, 1974, Ser. No. 483,896

Int. Cl.² C12D *13/10*

U.S. Cl. 195—66 R **7 Claims**

1. Process for preparing β-galactosidase, which comprises culturing *Aspergillus oryzae* ATCC 20423 in a nutrient medium, under an aerobic condition, at temperature of 20°–45°C, to accumulate an acid-active, acid-stable β-galactosidase in the cultured material, recovering said β-galactosidase from said material and refining the same.

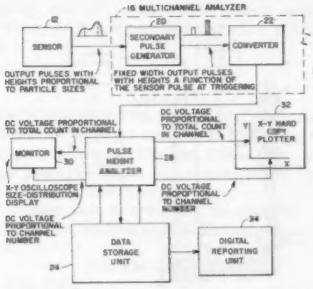
3,919,050
MICROPARTICLE ANALYSIS

William A. Curby, West Newton, Mass., assignor to Lahey Clinic Foundation, Inc., Boston, Mass.

Filed May 28, 1974, Ser. No. 473,498

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **21 Claims**



1. A method for analyzing micron- and submicron-sized bodies such as particles, cells, and organisms, to determine various characteristics such as sizes, shapes, and number, and for studying the dynamics of cellular growth and changes and rates of changes in sizes, shapes, and number of cells in living populations of organisms which comprises:

passing a given sample of said bodies in a fluid suspension through particle-detecting means to produce a primary voltage pulse as a function of dimensional characteristics of each body detected thereby;

feeding each of said primary pulses to secondary pulse producing means;

Actuating trigger means in said secondary pulse producing means during the duration of each of said primary pulses to produce secondary voltage pulses whose amplitude reflects the relative amplitude at the time of said triggering of said primary pulse associated therewith; and

Indicating the amplitude of said secondary pulses whereby indications of said amplitudes of said secondary pulses can be used to reflect the shape of said associated primary pulses at the times of said triggerings such that the bodies being analyzed can be characterized.

3,919,051
BIOLOGICAL ANALYZER AND METHOD

Robert B. Koch, Starkville, Miss.; Leroy D. Nelson, and Gerald D. Rork, both of Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 11, 1974, Ser. No. 487,709

Int. Cl.² C12K *1/04*, *1/10*

U.S. Cl. 195—103.5 R **11 Claims**

1. A flow through method for determining the concentration of a component of interest in a sample wherein the detection of the concentration or change therein of a gaseous indicating species following an enzyme-catalyzed reaction is indicative of the concentration of the component of interest, said method comprising the steps of:

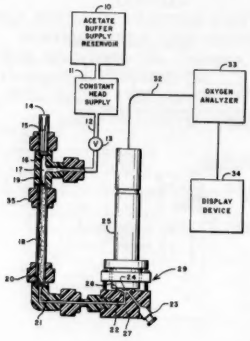
combining said sample with a carrier solution;

causing the combined solution to flow past a quantity of an enzyme selected to catalyze the desired reaction, wherein said enzyme is immobilized in a manner which allows free contact between the components in said combined solution and the enzyme molecules occasioning little or no loss of enzyme thereby;

after said reaction is substantially complete, causing the reacted solution to impinge upon a membrane selectively permeable to said gaseous indicating species at an angle with said membrane;

monitoring the concentration of said indicating species diffusing through said membrane;

generating an output indicative of the concentration of said indicating species;



transducing said output into one indicative of the value of the concentration of the component in the sample to be determined; and

removing said solution after contacting said membrane.

6. The apparatus of claim **5** wherein said first chamber is in the form of an enclosed packed column.

3,919,052

METHOD AND APPARATUS FOR CONTINUOUSLY CONTROLLING AN ENZYMATIC REACTION

Jean Marie Fresnel, Haut-Thoiry, France, and Danièle Trosset, Carouge, Geneva, Switzerland, assignors to Battelle Memorial Institute, Switzerland

Filed Jan. 8, 1974, Ser. No. 431,608

Claims priority, application Switzerland, Jan. 10, 1973, 259/73; Jan. 10, 1973, 260/73

Int. Cl.² C12B *1/00*

U.S. Cl. 195—115 **6 Claims**

1. A method of governing the reaction rate of enzymatic reactions wherein a substrate is continuously transformed by contact with at least one enzyme fixed to a solid carrier, said method comprising the steps of:

a. providing an enzymatic electrode with at least one enzyme fixed to the surface of a solid electronically conductive enzyme support

b. contacting a liquid reaction medium substrate, containing substances to be transformed, with said enzymatic electrode; and

c. regulating the catalytic activity of said enzyme by applying a potential to said electrode while adjusting the value of said potential in such a manner as to transform said substrate substances at a substantially uniform rate.

3,919,053

ASSEMBLY FOR SPECIMEN CULTURING

Malek M. Nazemi, Eastwood Medical Center, 10301 Gateway West, El Paso, Tex. 79925

Filed Sept. 10, 1973, Ser. No. 395,770

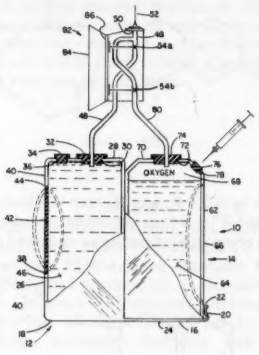
Int. Cl.² C12B *1/00*

U.S. Cl. 195—139 **10 Claims**

1. An assembly for collecting and culturing a sample of a specimen in a controlled anaerobic and/or aerobic environment, in combination comprising:

a first structural means defining an enclosure containing a medium, said means so constructed of a resilient, flexible material and arranged in such a manner that at least one wall portion can be forced inwardly when pressure is applied thereto by the fingers of a lab technician, said wall portion will inherently return to its normal configuration when the force being applied thereto is removed therefrom;

a second structural means defining another enclosure containing a predetermined quantity of sterile medium which substantially fills the interior thereof; said second structural means has a wall portion defining an opening that is closed and completely covered by a flexible, resilient



membrane means which when forced inwardly or expanded outwardly will inherently return to its original configuration when the force being applied thereto is removed therefrom, said membrane means is so constructed and arranged for visually indicating an increase in pressure within said second structural means;

hollow conduit means for directing the flow of fluid, said conduit means having at least one open end and including conduit means operatively interconnecting the interior of both the first and second structural means with said open end; and

valve means operatively associated with said conduit means for selectively directing the flow of fluid from the open end of the conduit means to either the first or second structural means.

3,919,054

DISTILLATION OF CHLOROXYLENES

Clifford Henry George Hands, deceased, late of Stourbridge, England; by Joan Hands, legal representative, Kinver, England, and by Donald Watson, legal representative, assignors to Albright & Wilson (Mfg.), Oldbury Warley, England

Filed Dec. 14, 1972, Ser. No. 314,943

Claims priority, application United Kingdom, Dec. 14, 1971, 58023/71

Int. Cl.² B01D *1/00*

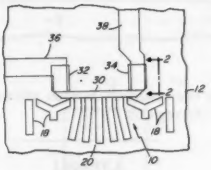
U.S. Cl. 203—6 **11 Claims**

1. A method of removing mono-chloroxylene from a mixture of α,α'-dichloroxylene and mono-chloroxylene comprising admixing an aliphatic amine which sequesters iron with said mixture, and heating, and distilling under reduced pressure from said mixture α-mono-chloroxylene to leave an undistilled residue, and recovering said residue having an increased content of α-α'-dichloroxylene and a reduced content of mono-chloroxylene.

3,919,055
BUBBLE DOMAIN DETECTOR CONTACT

Michael J. Urban, Framingham, Mass., assignor to GTE Laboratories, Waltham, Mass.

Filed Nov. 4, 1974, Ser. No. 520,582
Int. Cl.² C25D *5/00*; G11C *11/02*
U.S. Cl. 204—38 B **4 Claims**



1. A method of producing an electricl contact with a magnetoresistive element in a bubble memory detector device including the steps of:

a. depositing a pattern of magnetic film on a planar surface of a non-conductive glass substrate, the pattern being effective to propagate a magnetic bubble along a track in response to an in plane rotating field, the track including a bubble stretching section,

b. depositing a megnetoresistive film strip on the substrate and adjacent to the bubble stretching section,

c. depositing a layer of chromium effective to adhere to the glass and to form an adhering surface,

d. sputtering a first layer of gold over the ends of the magnetoresistive strip and on the substrate to form conductive leads connecting the magnetoresistive strip; and

e. electroplating a second layer of gold over the first layer, the combined thickness of the first and second layers being substantially greater than the thickness of the magnetoresistive strip.

3,919,056
ZINC PLATING PROCESS AND ELECTROLYTES THEREFOR

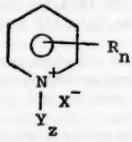
Edward Paul Habulak, Allen Park, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 293,659, Sept. 26, 1972, Pat. No. 3,821,095. This application Dec. 5, 1973, Ser. No. 421,923
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **38 Claims**

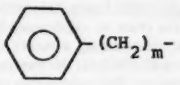
1. A method of producing bright, or brilliant zinc electrodeposits free of spores and/or striations over a wide current density range which comprises passing current from an anode to a metal cathode through an aqueous bath composition having a pH of 1.0 to 10.0 and containing at least one zinc compound providing zinc ions for electroplating zinc,

a. 1.0 gram per liter to 25 grams per liter of at least one bath soluble surfactant selected from the group consisting of bath soluble polyethers, substituted polyethers; and

b. 0.001 gram per liter to 4.0 grams per liter of at least one aromatic, non-carbonyl, non-nitrile, nitrogen-containing heterocyclic compound of the formula



wherein each R is independently hydrogen, alkyl, alkenyl, alkoxy, alkylamino, alkylsulfonic acid or salts thereof, sulfonic acid or salts thereof, halogen amino, hydroxyl, mercapto, benzyl, or phenylalkyl



(where m is an integer 0 to 4); *n* is an integer 0 to 3; z is 0 or 1; Y is oxygen, allyl, propargyl, benzyl, an alkoxy group, alkyl sulfonic acid -$(CH_2)_p$-SO_3^- (where p is an integer of from 1 to 4), an oxyalkylsulfonic acid, quinaldinyl, p-phenoxybenzyl or a halogenated alkeneyl radical in the absence of carbonyl and nitrile groups and X^- represents an anionic radical or the anionic moiety of Y or R provided that when Y is N-oxide X^- is absent.

3,919,057
PROCESS FOR THE ELECTROCHEMICAL FLUORINATION OF ORGANIC ACID HALIDES

Eric Plattner, Seltisberg; Christos Comninellis, Prilly, and Philippe Javet, Ecublens, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 9, 1974, Ser. No. 504,581
Claims priority, application Switzerland, Sept. 11, 1973, 13206/73
Int. Cl.² C25B *3/08*
U.S. Cl. 204—59 F **14 Claims**

2. A process according to claim **1**, which comprises electrolysing organic acid halides of the formulae

$CH_3(CH_2)_m COX$

and

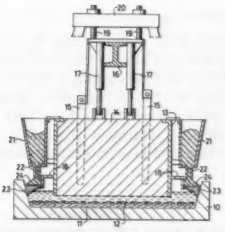
$CH_3(CH_2)_n SO_2X$,

wherein *X* represents fluorine, chlorine or bromine, *m* is an integer from 3 to 16 and *n* is an integer from 4 to 17.

3,919,058
ALUMINUM FURNACE CHARGING METHODS

Torsten Göran Emil Waenerlund, Sundsvall, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed May 13, 1974, Ser. No. 469,701
Claims priority, application Sweden, May 14, 1973, 7306755
Int. Cl.² C25C *3/06*, *3/14*
U.S. Cl. 204—67 **4 Claims**



1. A method of charging electrolysis smelting furnaces for the manufacture of aluminum and being of the type which comprise a vessel which forms the furnace cathode and which contains a molten bath comprising aluminum, formed by the electrolysis of aluminum oxide and a molten electrolyte, which has aluminum oxide dissolved therein, and a crust of solidified electrolyte and aluminum oxide located on top of said bath, and which furnaces further comprise at least one anode construction which is movable vertically and having an electrode immersed in said electrolyte, and an aluminum oxide magazine having at least one supply line depending therefrom and discharging a substantially predetermined dis-

tance above the crust for supplying aluminum oxide to the crust along the length of at least one side of the anode construction, aluminum oxide being fed to the molten bath by partially breaking the crust by raising and lowering the anode construction whilst maintaining contact between said electrode and the molten electrolyte, the improvement comprising maintaining a constant free communication between said magazine and said crust during normal operation of the furnace thereby to provide an automatic flow of aluminum oxide to the crust in a quantity which corresponds to that quantity of aluminum oxide locally received by the molten bath at any point along at least said one side, and maintaining along at least said one side a predetermined store of aluminum oxide to be electrolyzed which covers the crust.

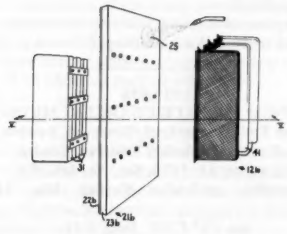
3,919,059
ELECTROLYTIC CELL

Carl W. Raetzsch; William B. Darlington, and Hugh Cunningham, all of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 337,050, March 1, 1973, Pat. No. 3,849,280, which is a division of Ser. No. 158,695, July 1, 1971, Pat. No. 3,759,813, which is a continuation-in-part of Ser. No. 55,680, July 17, 1970, abandoned. This application July 2, 1974, Ser. No. 485,177The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.² C25B *1/02, 1/34, 11/02, 11/04*

U.S. Cl. 204—129 **1 Claim**



1. The method of electrolyzing an aqueous alkali metal chloride solution in a bipolar electrolyzer comprising a backplate comprising an iron catholyte surface and a valve metal anolyte surface wherein a protective sheet is interposed between the steel catholyte surface and the said solution whereby molecular hydrogen is evolved between said steel catholyte surface and said protective sheet.

3,919,060
METHOD OF FABRICATING SEMICONDUCTOR DEVICE EMBODYING DIELECTRIC ISOLATION

H. Bernhard Pogge, Hopewell Junction, and Michael R. Poponiak, Newburgh, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 14, 1974, Ser. No. 479,321

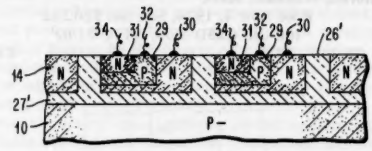
Int. Cl.² C25F *3/00*

U.S. Cl. 204—129.3 **17 Claims**

1. A method of producing a semiconductor structure having dielectrically isolated monocrystalline regions comprising:

a. forming high conductivity regions in a monocrystalline silicon body that surround on the sides and bottoms of monocrystalline silicon regions to be electrically isolated,

b. anodically etching the body in a hydrofluoric acid solution to selectively convert the high conductivity monocrystalline silicon regions to regions of porous silicon, and



c. oxidizing the resultant porous silicon regions to form silicon oxide regions.

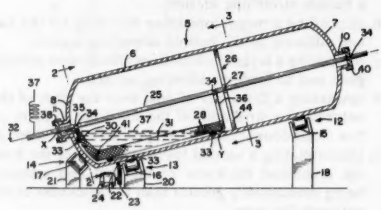
3,919,061
POLISHING LARGE CYLINDRICAL VESSELS OR TANKS WITH CLOSED ENDS

John F. Jumer, 16 W. 131 Timber Trails Drive, Elmhurst, Ill. 60126

Filed Dec. 13, 1973, Ser. No. 424,190

Int. Cl. C25f *3/22, 7/00*

U.S. Cl. 204—129.6 **10 Claims**



1. In the method of polishing the interior of an elongated vessel substantially symmetrical about its longitudinal axis and containing a bath of polishing liquid selected from the group consisting of an electropolishing bath and a chemical polishing bath while the vessel is rotated about its longitudinal axis, the improvement which comprises, supporting said vessel so that said longitudinal axis is materially inclined with respect to the horizontal during rotation and simultaneously polishing substantial portions of the inner surfaces of the lower end and side wall of said vessel while limiting the upper level of said bath so as not to cover more than about the lower half of the inner surface of said lower end, said bath being confined entirely within said vessel and having a volume substantially less than one-half the capacity of said vessel.

3,919,062
ELECTROCHEMICAL SYSTEM GRADUATED POROUS BED SECTIONS

Joseph Theodore Lundquist, Jr., Columbia, Md., and Jose D. Giner, Sudbury, Mass., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,775

Int. Cl.² C25F *5/00*

U.S. Cl. 204—149 **14 Claims**

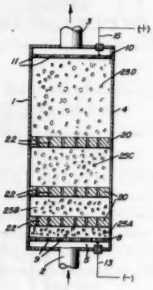
1. An electrochemical cell which comprises:

a stack of porous bed sections containing packed electrically conductive particles and a substantially uniform cross sectional area;

electrically insulating spacer means disposed for fluid flow arrangement in said stack between said bed sections to provide different section longitudinal thicknesses arranged in an order of increasing thickness across said stack;

primary electrodes disposed at opposite ends of said stack and operatively connected thereto;

means for flowing electrolyte through said stack in the direction of increasing bed section thickness whereby



said electrolyte is in contact with each of said porous bed sections in sequence; and

means for applying an electrochemical potential across said stack in a direction parallel to electrolyte flow.

3,919,063

ELECTRON-BEAM RADIATION-CURING METHOD OF UNSATURATED POLYESTERS DERIVED FROM ENDOMETHYLENE TETRAHYDROPHTHALIC ACID

Tsutomu Maruyama, and Koichiro Murata, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Continuation-in-part of Ser. No. 259,632, June 5, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,725

Claims priority, application Japan, June 9, 1971, 46-41313

Int. Cl.[2] C08F *8/00;* **C08G** *18/00;* **C08L** *67/06*

U.S. Cl. 204—159.15 **11 Claims**

1. A method for curing unsaturated polyester compositions which comprises applying electron-beam at a total dose of 0.5 to 50 Mrad and a dose rate of 0.1 to 30 Mrad per second to an unsaturated polyester composition comprising a vinyl monomer and unsaturated polyester dissolved therein, said vinyl monomer being a mixture of 40 to 70 weight percent of at least one of acrylic and methacrylic monomers and 30 to 60 weight percent of at least one of styrene and vinyl toluene, and said unsaturated polyester having an acid value of 4 to 11 and being a condensation product of 1.0 mole of a dicarboxylic acid and 1.0 to 1.2 moles of a polyhydric alcohol, and said dicarboxylic acid being a mixture of (a) 30 to 45 mole percent of at least one of endo-cisbicyclo-(2,2,1)-5-heptene-2,3-dicarboxylic acid and anhydride thereof, (b) 20 to 40 mole percent of at least one of unsaturated dicarboxylic acids and anhydrides thereof and (c) 15 to 55 mole percent of at least one of aromatic dicarboxylic acids, saturated aliphatic dicarboxylic acids and anhydrides thereof.

3,919,064

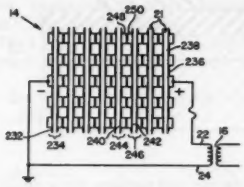
CORONA REACTOR METHOD AND APPARATUS

Frank Eugene Lowther, Phelps, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Division of Ser. No. 830,248, June 4, 1969, Pat. No. 3,798,457. This application July 16, 1973, Ser. No. 379,845

Int. Cl.[2] C01B *13/11*

U.S. Cl. 204—176 **10 Claims**



1. The process of exposing a fluid reactant to a corona discharge in a corona reactor core having a plurality of at least two of corona reactor cells comprising the step of electrically connecting at least two of said cells in series.

3,919,065

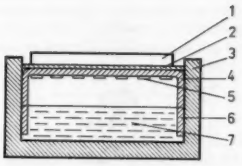
METHOD TO DIVERT HEAT GENERATED IN AN ELECTROPHORETICAL SEPARATION ESPECIALLY ISOELECTRIC FOCUSING AND ISOTACHOPHORESIS

Carl-Göran Hedén, Solna Kyrkvag 11, 171 64 Solna, Sweden

Filed June 27, 1974, Ser. No. 483,821

Int. Cl.[2] B01K *5/00*

U.S. Cl. 204—180 G **4 Claims**



1. Method for diverting of the heat, generated at electrophoretical separation, the electrophoretical separation being performed in a medium, contained in a vessel or applied to a support plate, characterized in that a cooling medium is exerting cooling effect by being evaporated, preferably from the surface of a porous wick, suspended at said vessel and support plate respectively, via which wick the cooling medium in liquid phase is sucked up from the container in which part of the wick is dipping.

3,919,066

METHOD OF MANUFACTURING ETCHED PATTERNS

Theodorus Cornelius Johannes Maria Bertens, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,879

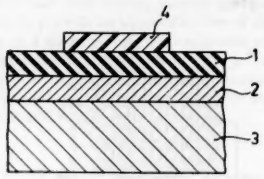
Claims priority, application Netherlands, Oct. 7, 1972, 7213625

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 **1 Claim**

1. In a method of manufacturing sputter etched patterns in thin layers having desired edge profiles comprising applying to a substrate a thin layer of a substance to be sputter etched, applying to the portions of said thin layer desired to be protected from sputter etching a sputter etching mask having the desired edge profile, said sputter etching mask being formed

on said layer by depositing a layer of silicon dioxide thereon, applying a layer of photolacquer on said silicon dioxide layer, selectively exposing said photolacquer layer, developing and heating said exposed photolacquer layer, thereby leaving exposed selected portions of the silicon dioxide layer, removing by etching the exposed portions of the silicon dioxide layer to produce a sputter etching mask of silicon dioxide having the desired edge profile, and then sputter etching to remove the silicon dioxide mask and unprotected thin layer at substantially the same time and to form the etched pattern in the thin layer.



3,919,067

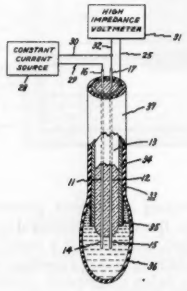
VOLTAMMETRIC OXYGEN SENSOR

William N. Carson, Jr., and Leonard W. Niedrach, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,836

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **2 Claims**



1. A voltammetric oxygen sensor comprising

a. a pair of parallel spaced apart elongated platinum wire electrodes, said platinum electrodes being electrically insulated from each other by electrical insulation but having their opposite end portions exposed,

b. constant current source means connected across said platinum electrodes coupled electrically to each proximal end portion thereof, said constant current source polarizing the platinum electrodes producing a platinum cathode and a platinum anode,

c. an associated silver-silver halide reference electrode surrounding at least partially said platinum electrodes and being electrically insulated therefrom,

d. a high impedance voltmeter connected across and coupled electrically to the said proximal end portion of said platinum cathode and the silver of said reference electrode providing a cathode-reference electrode voltage readout,

e. an electrolyte solution in mutual contact with at least the distal end portions of said platinum anode, said platinum cathode and said silver halide of said reference electrode, and

f. an oxygen permeable electrically insulating diffusion barrier material encapsulating said electrolyte solution and at least the distal portions of said electrodes.

3,919,068

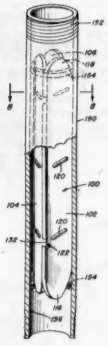
SYSTEM STABILIZER

Wildon A. Gary, 305 NW. 7th Ave., Mineral Wells, Tex. 76067

Continuation-in-part of Ser. No. 305,091, Nov. 15, 1972, Pat. No. 3,835,015. This application May 31, 1974, Ser. No. 475,249

Int. Cl.² C23F *13/00*; C02B *1/82*

U.S. Cl. 204—197 **25 Claims**



1. An elongated tubular stabilizer rod adapted for insertion into a conduit having fluid flowing therein comprising at least three identical elongated, generally planar side members, each of said members including a pair of opposite generally planar faces and opposite side longitudinal edges, a plurality of projections disposed transversely to the longitudinal extent of said members extending outwardly from each of said faces, said side members being positioned to form a tubular rod including at least three lengthwise extending adjacent peripheral side walls defined by said members, said members defining therebetween a lengthwise extending passageway for the flow of fluids therein, adjacent longitudinal side edges of said members including means constraining said members against relative longitudinal shifting.

3,919,069

MEANS FOR PLATING STRANDED CABLES

Dieter Ascher, Klosterneuburg, Austria, assignor to Firma Karl Neumayer GmbH, Leobersdorf, Austria

Filed Aug. 15, 1972, Ser. No. 280,833

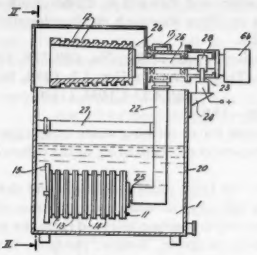
Claims priority, application Austria, Aug. 16, 1971, 7151/71

Int. Cl.² C10G *19/00*; C25D *7/00*

U.S. Cl. 204—206 **6 Claims**

1. An apparatus for plating a stranded flexible element, comprising a vessel adapted to contain a plating bath up to a predetermined level, upper roller means above said level in said vessel provided with a first set of axially spaced peripheral annular groves, lower roller means below said level in said vessel provided with a second set of axially spaced annular grooves substantially aligned with the grooves of said first set for guiding an element to be plated in a multiplicity of parallel, slack loops into and out of the bath, and drive means coupled with said upper roller means for advancing said element through said vessel; the radius of the grooves of at least one

of said sets progressively decreasing, in the direction of successive engagement by said element, by at least an amount



corresponding to the thickness of a coating deposited thereon in a preceding immersion in the bath.

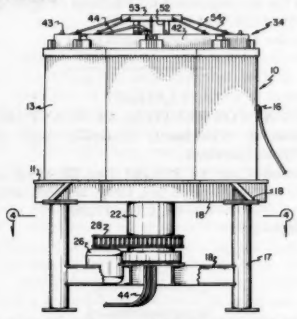
3,919,070
ELECTROLYTIC CELL

Reed Goold; Charles W. Wojcik, both of Twin Falls, and Gerald D. Cooper, Pocatello, all of Idaho, assignors to Wilfred H. Herrett, Filer, Idaho, a part interest

Continuation-in-part of Ser. No. 288,771, Sept. 13, 1972, Pat. No. 3,806,434. This application Feb. 25, 1974, Ser. No. 444,784

Int. Cl.² C25C *1/00*

U.S. Cl. 204—222 **5 Claims**



1. An electrolytic cell, comprising a polygonal shaped tank having its inner sidewall surfaces lined with conductive material enabling it to function as an anode; a cathode rotor located concentrically within said tank; means mounting said cathode rotor for oscillation within said tank; said cathode rotor comprising a top and a depending sidewall, said sidewall comprising a non-conductive frame and a plurality of conductive cathode plates supported in said frame, said frame comprising a plurality of equally spaced vertical members and transverse members connecting the bottom ends of adjacent ones of said vertical members, slots adapted to receive the side and bottom edges of said cathode plates in the facing edges of said vertical members and the top edge of said transverse members, said plates and slots forming junction lines where said plates enter said slots; means for connecting said tank wall lining and said cathode plates respectively to the positive and negative poles of a direct current source; and means for shading said junction lines from line-of-sight current flow between said tank wall liner and said cathode, said means comprising for each of said junction lines an elongated strip of non-conductive material of length at least equal to the length of the junction line with which it is associated and of width to extend on both sides of said junction line, and means mounting said strip to said frame in spaced parallel relationship therewith and between said junction line and said tank wall.

2. The electrolytic cell according to claim **1** with the addition of a curved baffle adjacent at least one bottom corner of each cathode plae, said baffle being curved to extend from a horizontal portion beneath one of said cathode plates to terminate in a vertical portion adjacent the side of said one cathode plate at an elevation approximate the elevation of the junction line defined by the bottom of said cathode plate with said transverse frame member.

3,919,071
SEAL FOR ANODE STEMS IN AN ELECTROLYSIS CELL

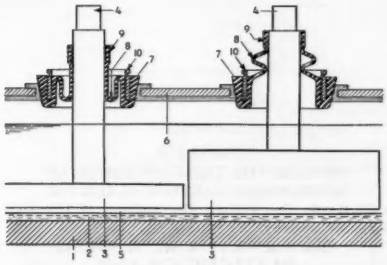
Luciano Mose', Dortmund, Germany, assignor to Friedrich Uhde, GmbH, Dortmund, Germany

Filed Aug. 5, 1974, Ser. No. 494,745

Claims priority, application Germany, Aug. 9, 1973, 2340240

Int. Cl.² C25B *11/12*; B01K *1/00*

U.S. Cl. 204—286 **6 Claims**



1. A seal of elasomeric material between an anode stem and the edge of the hole in the stationary cover of an electrolysis cell through which the stem freely projects, said seal comprising a unitary structure having a tapered ring plug for fitting the cover hole, a sleeve for engagement with the anode stem, and a neck part connecting said ring plug and said sleeve.

3,919,072
RESINS FROM HIGH BOILING HYDROCARBONS AND ASPHALTS CONTAINING THE SAME

Armin C. Pitchford, and Gene N. Woodruff, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 17, 1973, Ser. No. 398,083

Int. Cl.² C07C *3/08*

U.S. Cl. 208—4 **10 Claims**

1. A process for producing an additive, suitable for use in the production of high quality asphalt usable for paving said additive containing petroleum resin, which process comprises (1) air blowing a hydrocarbon oil fraction having the following properties:

API Gravity, 60° F, 2.0–30
Aniline Point, °F, 75–230
Viscosity, SFS, 122°F, 5–500
H/C Mol Ratio, 1.2–2.0
IBP, °F, 500–1000
50 percent Point, °F, 700–1000
Carbon Residue, Rams., percent, 0.2–18
No. Avg. Mol. Wt., 200–1,000
Paraffin Hydrocarbon Content, Wt. percent, 0.1–80

at an elevated temperature in the range of from about 350° to about 600°F for a period of time sufficient at said temperature to produce a treated fraction containing resin-forming materials and (2) subsequently, heating to a temperature in the range of about 500° to about 600°F said treated fraction in the presence of a catalyst chosen from among $ZnCl_2$, $FeCl_3$, and $SnCl_2$ to produce a treated hydrocarbon oil fraction which contains petroleum resin.

3,919,073

HEAT RESISTANT ALLOY FOR CARBURIZATION RESISTANCE

Donald L. Bagnoli, Oak Ridge, and Anthony R. Ciuffreda, Colonia, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 387,946, Aug. 13, 1973, Pat. No. 3,865,634. This application Aug. 28, 1974, Ser. No. 501,220
Int. Cl.[2] C10G *9/16, 9/22*
U.S. Cl. 208—47 3 Claims

1. A method for heating hydrocarbons by contact with heated metal surfaces containing nickel and iron under conditions which are likely to result in carburization of the metal, which comprises contacting said hydrocarbons with a heated metal surface that has an adherent layer of manganese and chromium oxide on the metal surface which is in contact with the hydrocarbon, whereby the metal is protected against carburization and heat is passed from the metal to the hydrocarbon.

3,919,074

PROCESS FOR THE CONVERSION OF HYDROCARBONACEOUS BLACK OIL

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 22, 1974, Ser. No. 499,741
Int. Cl.[2] C10G *9/16, 13/06*
U.S. Cl. 208—48 R 4 Claims

1. A process for the conversion of a hydrocarbonaceous black oil, which process comprises the steps of:

a. admixing said black oil with hydrogen and heating the resulting mixture in a heater to a temperature above about 600°F.;

b. recycling at least a portion of the heated mixture to the inlet of said heater;

c. contacting at least a portion of the heated mixture with a catalytic composite in a conversion zone maintained at hydrocarbon conversion conditions; and,

d. recovering a converted hydrocarbon product.

3,919,075

PROCESS FOR REGENERATING USED LUBRICATING OILS

Guy Parc, Rueil Malmaison; Maurice Born, Nanterre, and Alexandre Rojey, Vannes, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 9, 1974, Ser. No. 459,413
Claims priority, application France, Apr. 12, 1973, 73.13360; Aug. 2, 1973, 73.28417; Nov. 8, 1973, 73.39811
Int. Cl.[2] B01D *3/28;* C10G *7/00*
U.S. Cl. 208—180 26 Claims

1. A process for regenerating a used lubricating oil containing at least one soluble metal compound of lead, calcium, barium, magnesium, zinc or aluminum, which comprises circulating said oil along a first face of a membrane permeable to hydrocarbons and collecting a purified oil on the second face of the membrane, said membrane having a cut zone in the range of from 5,000 to 300,000.

8. A process according to claim 1, wherein the process is that of ultrafiltration and the membrane is an ultrafiltration membrane.

3,919,076

RE-REFINING USED AUTOMOTIVE LUBRICATING OIL

Louis E. Cutler, and Edward T. Cutler, both of Merion, Pa., assignors to Pilot Research & Development Co., Merion Station, Pa.

Continuation-in-part of Ser. No. 489,779, July 18, 1974, abandoned. This application Dec. 12, 1974, Ser. No. 532,167
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 3 Claims

1. A process for re-refining waste crankcase oil and similar waste hydrocarbon oils consisting of the following consecutive steps:

a. Screen out large pieces of debris and dehydrate the oil;

b. Mix the dry oil with 1 to 15 times its volume of a saturated hydrocarbon selected from the group consisting of ethane, propane, butane, pentane, hexane, and mixtures thereof while keeping the mix liquid under pressure at a temperature near but below its critical point;

c. Settle the mix, drain off the bottoms, and separate the clarified oil-solvent mix;

d. Strip the solvent from the clarified oil-solvent mix of step (C), condense it, and store for reuse;

e. Vacuum distill the stripped oil of step (d) at a pressure no greater than 10 torr and a temperature no greater than 650°F., distilling over all but 10-15% of the charge stock and fractionate the distillate;

f. Hydrogenate the condensed hot oil fraction over a catalyst consisting of one or more Group VI and/or VIII metal oxides or sulfides at 500°–800°F, 500–1000 psig, and L.H.S.V. of 0.5–2.0;

g. Strip the hydrogenated oil fractions of hydrogen, reduction products, and light ends;

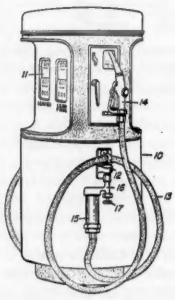
h. Cool the hydrogenated oil and filter it.

3,919,077

SORBENT FOR REMOVAL OF HEAVY METALS

Darrell Duayne Whitehurst, Titusville, N.J., assignor to Mobil Oil Corporation

Continuation of Ser. No. 319,264, Dec. 29, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,609
Int. Cl. C10g *17/00*
U.S. Cl. 208—251 5 Claims

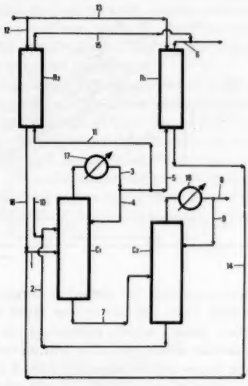


1. A method for effecting the removal of heavy metal contaminants from solution in a substantially hydrocarbon solvent which comprises contacting said solution, in a flowing system, with a solid sorbent having a surface area of at least about 10 m^2/g, having pores of at least about 10 angstroms diameter and comprising a material selected from the group consisting essentially of carboxylic or sulfonic acid substituted organic cation exchange resin or a zeolite-X zeolite which has bonded thereto through its acid sites a metal of Groups IB, IIB or IVA of the Periodic Table having an atomic weight of at least 29.

3,919,078
PROCESS FOR SEPARATING AROMATIC HYDROCARBONS BY EXTRACTIVE DISTILLATION

Georges Cohen, Rueil Malmaison; Francis Gracco, Montesson, and Paul Mikitenko, Chatou, all of France, assignors to Institut Francais du Petrole, Paris, France

Filed Apr. 5, 1974, Ser. No. 458,122
Claims priority, application France, Apr. 6, 1973, 73.12594
Int. Cl.[2] C10G 21/20, 21/28
U.S. Cl. 208—313 13 Claims



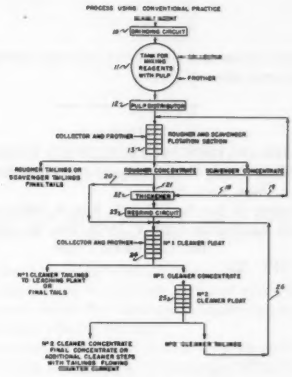
1. A process for separating aromatic hydrocarbons from a mixture contining the same together with at least one saturated, paraffinic or cyclanic, branched or unbranched hydrocarbon, by extractive distillation in the presence of an aliphatic alkyl amide polar solvent, comprising separating a top fraction of the distillate, enriched with saturated hydrocarbons and containing a minor proportion of the aliphatic alkyl amide polar solvent and and a bottom fraction enriched with aromatic hydrocarbon and containing a major portion of the aliphatic alkyl amide polar solvent and subjecting the bottom fraction to a distillation for separating the aromatic hydrocarbon from the major portion of the aliphatic alkyl amide polar solvent, said process further comprising contacting the distillate with a ion exchange resin so as to obtain a distillate enriched with saturated hydrocarbon and free from the aliphatic alkyl amide polar solvent and subsequently contacting the resin with an elution agent comprising at least one hydrocarbon so as to displace the aliphatic alkyl amide polar solvent selectively retained thereon.

3,919,079
FLOTATION OF SULPHIDE MINERALS FROM SULPHIDE BEARING ORE

David Weston, 34 Parkwood Ave., Toronto, Canada

Continuation-in-part of Ser. No. 267,205, June 28, 1972, abandoned, Continuation-in-part of Ser. No. 270,961, July 19, 1972, Pat. No. 3,735,931, Continuation-in-part of Ser. No. 304,540, Nov. 7, 1972, abandoned. This application Mar. 7, 1973, Ser. No. 339,384The portion of the term of this patent subsequent to May 29, 1990, has been disclaimed.
Int. Cl.[2] B03D 1/02
U.S. Cl. 209—166 91 Claims

1. A process for the recovery by froth flotation of minerals from ores containing at least one sulphide mineral and wherein said at least one sulphide mineral is a major economic component of the ore and wherein a pulp of the ore has been prepared consisting of a pulp density selected from the range of about 20 to 60 percent solids and said solids of said ore have been ground to flotation feed size comprising: subjecting said prepared pulp of the ore to conditioning in at least one agitation conditioning circuit consisting of at least one alkaline agitation conditioning stage and at least three agitation conditioning steps wherein in said at least three alkaline agitation conditioning steps the conditioning is carried out in the presence of an alkaline agent selected from the group consisting of lime or calcium hydroxide, sodium hydroxide, sodium carbonate, and ammonium hydroxide and wherein the pH of the pulp is at at least one optimum pH point within the pH range of about 8.0 to 12.0 and wherein at least the final agitation conditioning step prior to flotation a sufficient concentration of collector selected from the group of sulfhydryl anionic collectors is present and said concentration of collector is in the range of about 0.02 to 0.40 pounds per ton of ore and wherein said pulp is agitation conditioned with agitation conditioning mechanisms with sufficient power consumption per ton of ore treated said power consumption being in the range of about 0.10 to 0.45 kilowatt hours per ton of ore per 4.0 minutes residence time of the ore in said at least one agitation conditioning stage and for a sufficiently long period of time and wherein said period of time is in the range of about 4.0 to 40 minutes to produce heavy activation of said at least one sulphide mineral to achieve high recovery of said at least one sulphide mineral in at least one subsequent froth flotation stage: subsequently in the presence of a suitable frother subjecting said agitation conditioned pulp to froth flotation to produce at least one flotation concentrate enriched in said at least one sulphide mineral and a tailings impoverished in said at least one sulphide mineral.



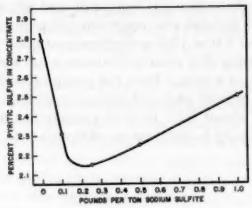
3,919,080
PYRITE DEPRESSION IN COAL FLOTATION BY THE ADDITION OF SODIUM SULFITE

John C. Stauter, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 14, 1972, Ser. No. 289,037
Int. Cl. B03d 1/06
U.S. Cl. 209—167 3 Claims

1. A froth flotation process for reducing sulfur concentration of a coal containing pyrite comprising mixing in a flotation cell a fine particle size fraction of said coal with an aqueous media and a flotation gas in the presence of a soluble salt of a metal cation and an anion capable of forming sulfite in an aqueous media whereby the fine coal particles are removed

from the cell in froth and pyrite flotation is depressed with a substantial portion of the pyrite being removed from the cell



in the liquor phase and recovering said coal having a reduced sulfur concentration.

3,919,081

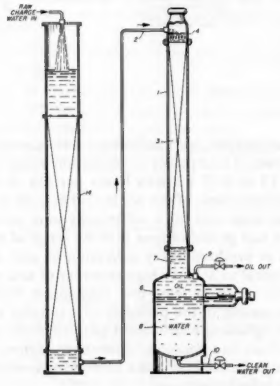
SEPARATION OF EMULSIFIED LIQUIDS

Issac P. Mail, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Continuation of Ser. No. 87,526, Nov. 6, 1970, abandoned. This application Sept. 1, 1972, Ser. No. 285,713

Int. Cl.[2] B01D *17/04*

U.S. Cl. 210—23 **5 Claims**



1. A process for separating insoluble liquid hydrocarbon and water which are bound together in an emulsion in which the dominant phase is the water, including,

forming a bed of activated carbon,

washing alkaline ash from the activated carbon with acid,

saturating the bed with insoluble liquid hydrocarbons to form passages through the bed with insoluble liquid hydrocarbons as their walls,

passing the emulsion through the bed to agglomerate the insoluble liquid hydrocarbon in the mixture,

and collecting and discharging the insoluble liquid hydrocarbon and water separately.

3,919,082

ELUTION APPARATUS AND METHOD

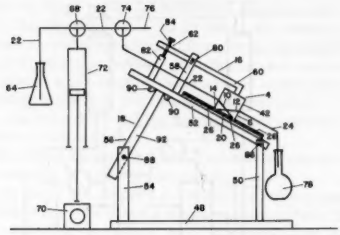
Heinz Falk, Augst, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 251,929, May 10, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 449,013

Claims priority, application Switzerland, May 13, 1971, 7080/71

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C **5 Claims**



1. An elution apparatus for eluting a chromatographically isolated substance from the absorption layer of a thin layer chromatographic plate, which comprises an elution head having a base section which has a flat bottom surface, a sealing skirt about the base section standing proud of said bottom surface to the extent of only slightly greater than the thickness of the absorption layer to provide a seal between the base section and a surface of the chromatographic plate cleared of absorption layer around the isolated substance and to thus define an elution chamber, an eluent inlet conduit leading into the elution chamber at a position adjacent the sealing skirt to one side of the elution chamber, an eluate outlet conduit leading from the elution chamber at a position adjacent the sealing skirt to the opposing side of the elution chamber, connection means for connecting up the inlet and outlet conduits respectively to an eluent supply line and eluate take off line, a tiltable table to support the thin layer chromatographic plate, and clamp means associated with the table to clamp the elution head in position on the chromatographic plate.

3,919,083

TREATMENT OF FLOATING POLLUTANTS

Denis J. O'Sullivan, Sutton, and Bernard J. Bolger, Foxrock, both of Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 159,572, July 2, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,701

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—54 **12 Claims**

1. A process for reducing the menace of a floating waterborne pollutant which comprises applying to at least a portion of such pollutant a liquid composition containing a polymerizable monomeric or oligomeric ester of 2-cyanoacrylic acid or solution thereof, said ester polymerizing after contact with said pollutant to form a solid matrix with incorporation therein of at least a portion of said pollutant.

3,919,084

RAPID SETTLER APPARATUS

Michael J. Bebech, R.D. No. 1, Box 73, Masury, Ohio 44438

Filed Jan. 22, 1974, Ser. No. 435,457

Int. Cl. C02c *1/27*

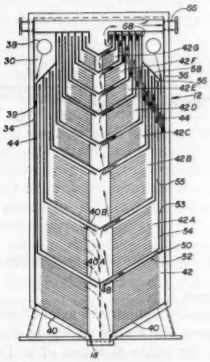
U.S. Cl. 210—73 **10 Claims**

1. Solids settler apparatus for liquid-solid mixtures comprising:

a plurality of abutted flat separator modules each including a plurality of vertically spaced separator chambers each

having a pair of downwardly and inwardly inclined stacks of settler means therein; a center solids collecting zone; a bottom solids discharge outlet; and conduit means leading from an upper portion of the lowermost chamber to the next vertically adjacent chamber and from such adjacent chamber to the chamber vertically there adjacent and repeating to the top one of said chambers; said settler means comprising trays, and each of said modules include a face carrier plate, a bottom plate, and a pair of side plates, said conduit means comprising plates extending from said carrier plate, all of said plates being secured at one edge thereof to said carrier plate and extending therefrom a uniform distance, and an opposed closure plate at the oppsite face of the module and sealed against the other edges of said plates,

said conduit means comprising conduit forming plates connecting to an input for each chamber at the laterally outer ends thereof and with at least one of said conduit forming plates being at a center upper portion of each chamber to air in forming an outlet thereof to connect to the inlet for the next vertically above adjacent chamber, all of said conduit forming plates being secured at one edge to said carrier plate, the trays of each stack being closely adja-



cent vertically to one another for flow of the liquid-solid mixture inwardly and downwardly over the trays to an open center solids collecting zone in each chamber.

9. A method of settling solids from a solid-liquid mixture in an enclosure comprising the steps of

a. flowing the mixture into the enclosure to the bottom chamber formed therein,

b. passing the mixture downwardly and inwardly in the chamber to a vertically open center area in a plurality of separate vertically narrow streams for solids deposit therefrom and in the chamber,

c. forcing the solids-liquid mixture from an upper portion of said center area laterally outwardly and upwardly to the laterally outer ends of a second chamber vertically above and immediately adjacent the bottom chamber,

d. repeating the flow of the mixture downwardly and inwardly of the second chamber in the plurality of separate vertically narrow streams and then outwardly and upwardly to a third vertically higher chamber in the same manner as in step (c) for additional separation therein,

e. discharging liquid from the top of the enclosure, and

f. discharging the separated solids at the bottom of the enclosure.

3,919,085

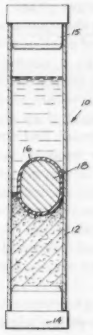
PLASMA SEPARATOR ASSEMBLY

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, N.J.

Filed Feb. 27, 1974, Ser. No. 446,380

Int. Cl.² B01D *21/26*

U.S. Cl. 210—83 **5 Claims**



1. A method for separating blood into its light phase of serum or plasma and its heavy cellular phase, which comprises;

A. Providing an assembly which comprises;

a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

a closure sealing the open end of the container, the closure being formed of a self-sealing, elastomeric material which is penetrable by a cannula through which blood to be separated may be conducted into the container;

a barrier member within said container, said barrier member being formed of an outer shell of elastomeric material which encloses a meltable mass of material which is normally solid at room temperatures and which has a melting point slightly above 98.6°F. said barrier member and said meltable mass together having a specific gravity heavier than the light phase of blood but lighter than the cellular heavy phase, said barrier member having a normal dimension and configuration when said mass is above its melting point so as to form a liquid-tight seal with the inner walls of said container, thereby dividing said container into upper and lower sealed chambers; said barrier member having a deformed dimension and configuration when said barrier is deformed while said mass is above its melting point, and then allowed to resolidify by cooling below its melting point, said barrier member being placed in said container in a deformed configuration prior to separating the blood collected in the assembly whereby in said deformed configuration said seal is not established and said container defines a single chamber;

B. introducing blood into the assembly through the self-sealing, elastomeric closure;

C. subjecting the blood containing assembly to centrifugal force whereby the heavy cellular phase moves downwardly in the container and the barrier member moves to and stops at the light phase-heavy cellular phase interface; and

D. heating the meltable mass to a temperature above 98.6°F to return the deformed barrier toward its normal configuration so that the member forms a liquid-tight seal between the outer surfaces of the barrier member and the inner wall of the container thereby effecting a sealed

separation of the light phase and the heavy cellular phase of the blood and

E. Then resolidifying said meltable mass by cooling below 98.6°F.

2. A separator assembly capable of separating blood into a plasma/serum or light phase and a cellular or heavy phase comprising:

a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

a closure sealing the open end of the container, the closure being formed of a self-sealing, elastomeric material which is penetrable by a cannula through which blood to be separated may be conducted into the container;

a barrier member within said container, said barrier member being formed of an elastomeric material and having a normal dimension and configuration so as to form a seal with the inner walls of said container, thereby dividing said container into upper and lower sealed chambers; said barrier member having associated therewith means for retaining the barrier member in a deformed configuration prior to separating the blood collected in the assembly whereby in said deformed configuration said seal is not established and said container defines a single chamber; and

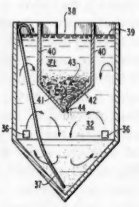
said means being capable of returning the barrier member to its normal configuration in the container; and wherein the barrier member comprises an outer shell of elastomeric material which encloses said means and said means comprises a mass of material which is normally solid at room temperatures and which has a melting point slightly above 98.6°F; and said barrier member and said means together having a specific gravity heavier than the light phase of blood but lighter than the cellular heavy phase.

3,919,086

SEWAGE TREATMENT APPARATUS

David F. Peck, and Joseph C. Troy, both of Pittsburgh, Pa., assignors to NUS Corporation, Rockville, Md.

Filed Sept. 11, 1973, Ser. No. 396,266
Int. Cl. C02c *1/08*
U.S. Cl. 210—197 **4 Claims**



1. An apparatus for treating and purifying wastewater containing organic pollutants comprising:

1. a vessel having vertical end and sidewalls and a bottom portion in the shape of an inverted pyramid;

2. an inner settling compartment within said vessel and smaller than said vessel defined by vertical walls extending from one side of said vessel to its opposite side, and inclined lower portions which define a slot communicating between said settling compartment and the lower portion of said vessel, the vertical walls of said settling compartment being separated from the vertical walls of said vessel and defining a first space therebetween;

3. a plurality of air sparges disposed in the lower portion of said vessel to aerate the wastewater therein;

4. means to feed said wastewater into said first space;

5. air-lift pump means having its suction end disposed near the apex of said inverted pyramid and its discharge end disposed in said first space above the level of wastewater in said first space;

6. means for removing the sludge that accumulates in the apex of inverted pyramid; and

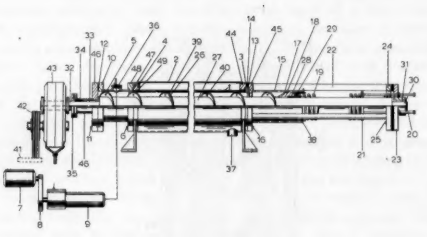
7. exit means in one end of said vessel within said inner settling compartment; wherein the wastewater fed to said first space descends in said vessel, is aerated in the lower portion thereof and then flows upwardly through said slot and out from said vessel through said exit means, wherein a bed of sludge is established in the lower portion of said settling compartment through which the aerated wastewater must flow, upwardly thereby further purifying said wastewater.

3,919,087

CONTINUOUS PRESSURE FILTERING AND/OR SCREENING APPARATUS FOR THE SEPARATION OF LIQUIDS AND SOLIDS

Ivan S. Brumagim, North Warren, Pa., assignor to Secondary Processing Systems, Warren, Pa.

Continuation of Ser. No. 274,881, July 25, 1972, abandoned. This application May 20, 1974, Ser. No. 471,330
Int. Cl.² B01D *25/38*
U.S. Cl. 210—350 **6 Claims**



1. An apparatus for continuous separation of liquids and solids comprising,

a cylindrical screen,

a hollow compression cylinder in axial alignment with said cylindrical screen and having an inside diameter substantially equal to the inside diameter of said screen,

means connecting said cylinder to said screen,

a shaft extending through said screen and through said compression cylinder,

a screw fixed to said shaft,

said screw having an outside diameter adapted to rotate in close proximity to the inside of said screen,

means to rotate said shaft,

bearing means supporting each end of said shaft,

support means fixed to said screw extending over said compression cylinder supporting one said bearing,

a hollow axial cylindrical piston reciprocably received in said compression cylinder in close proximity to the inside diameter of said cylinder,

said piston having a central bore slidably receiving said shaft,

resilient means disposed around said shaft urging said piston into said cylinder,

feed means for feeding liquid and solid fractions into said screen at the end thereof remote from said piston,

said screen being adapted to allow said liquid to flow through said screen, retaining said solids in said screen,

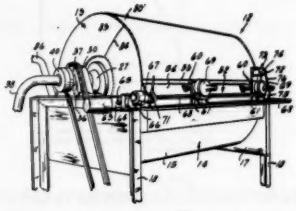
and means to collect said liquids as they flow through said screen,

said screw being adapted to move said solids into said cylinder against said piston and to force said piston axially from said cylinder whereby some of said solids are extruded from said cylinder.

3,919,088
ROTARY VACUUM FILTER

Alexander J. Doncer, Burbank, and Harold R. White, New Lenox, both of Ill., assignors to Alar Engineering Corporation, Burbank, Ill.

Filed Mar. 22, 1974, Ser. No. 453,796
Int. Cl.² B01D 33/06
U.S. Cl. 210—402 8 Claims



1. Precoat vacuum filter apparatus for collecting filtrate within a horizontally rotating filter drum at the approximate level of the axis thereof, said apparatus comprising, in combination:

a tank member with an open top, sidewalls, and a pair of longitudinally spaced endwalls interconnected therewith, a hollow filter drum having an axis and comprising a pair of spaced apart end plate means connected by spaced parallel rods longitudinally arranged to define peripheral surfaces of said drum, said peripheral surfaces being further defined by spaced rods circumferentially arranged around said drum between said end plates, said drum including means for supporting a filter cloth means over said peripheral surfaces,

shaft means extending axially in opposed direction from each said end plate means, the shaft means from one said end plate being hollow and being in fluid communication with the interior of said drum at the approximate level of said axis,

bearing means adjacent each one of said pair of spaced endwalls for supporting said shaft means and constructed and arranged to locate at least one half of the interior volume of said drum within said tank member,

inlet means associated with said tank for supplying liquid to be filtered into said tank in the space therein exteriorly of said drum,

outlet means for removing filtered liquid comprising fluid pump means, a rotary coupling means connected to the outward end of said hollow shaft means, and pipe means interconnecting said fluid pump means and said rotary coupling,

agitator means located in said tank exteriorly of said drum for maintaining solid materials suspended in liquid in said tank,

blade means with an edge thereof adjustably spaced apart from said peripheral surfaces along the length thereof, and

drive means constructed and arranged to rotate said drum, to operatively power said fluid pump means and said agitator means,

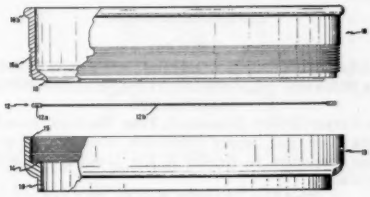
and to adjustably locate said blade edge relative to said peripheral surfaces,

whereby liquid filtered by said hollow drum through a filter cloth thereon is retained within the interior thereof at a liquid level about said approximate level and filtrate liquid above said approximate level is removed from the interior of said drum by said fluid pump means through said hollow shaft means.

3,919,089
SELF-TIGHTENING FILTER ASSEMBLY

Guillermo Gonzalez Gonzalez, Guadalajara, Mexico, assignor to Refacciones Plasticas y Metalicas, S.A., Mexico

Filed June 1, 1973, Ser. No. 365,856
Claims priority, application Mexico, Nov. 8, 1972, 139573
Int. Cl.² B01D 35/00
U.S. Cl. 210—445 3 Claims

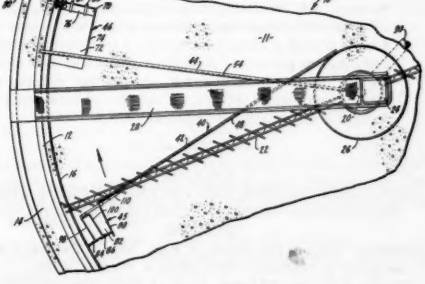


1. Self-tightening straining assembly comprising: a main body comprised of two sections which are telescopingly secured to each other by means of threads; a sieve is between said sections and having its outer sieve margin supported on an inner shoulder of said lower section of said body; the upper section of said body being provided with an inner radially and axially inwardly extending annular projection which projects radially inwardly of said axially beyond said shoulder that supports said outer sieve margin; the inner most end of said projection being positioned and engageable with a center section of the sieve which is free of said shoulder and any bottom side support and with the center section being in radially inwardly spaced relation with respect to said outer sieve margin; said sections being threadingly engaged to securely clamp said outer sieve margin in fixed assembly on said shoulder between said sections, the outer sieve margin and the center sieve section being constructed and arranged whereby the position of the threads can be adjusted to enable a variable tightening action to be exerted by said lowermost end of said annular projection against said center section of said sieve.

3,919,090
SURFACE SKIMMING SYSTEM

Robert L. Shaffer, Olathe, Kans., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sept. 11, 1974, Ser. No. 505,193
Int. Cl.² B01D 21/06
U.S. Cl. 210—523 13 Claims



1. In combination with a circular tank adapted to receive liquid, means for removing floating matter from the surface of the liquid, said means comprising:

a. a surface skimming arm positioned within said tank for rotation about a centrally disposed vertical axis so as to push the floating matter ahead of it; and

b. a scum pocket means secured to and carried by the outer end of said surface skimming arm for receiving and directing said floating matter into a scum collection assembly positioned adjacent the outer periphery of said tank, said scum pocket means being defined by a first inner side member secured to said skimming arm, an outer side member rigidly affixed within said tank, and a pair of skimmer blade means extending between and independently biased to seal against said first inner side member and said outer side member.

3,919,091

FABRIC SOFTENING COMPOSITIONS CONTAINING QUATERNARY ALLOPHANOYLMETHYLAMMONIUM COMPOUNDS

Hans-Werner Eckert, Dusseldorf; Peter Nikolaus, Dusseldorf-Holthausen, and Johann Schwarzer, Monheim, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed May 21, 1973, Ser. No. 362,314

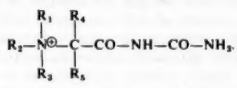
Claims priority, application Germany, May 19, 1972, 2224553

Int. Cl.² D06M *13/46*; C07C *127/22*

U.S. Cl. 252—8.8 **9 Claims**

1. A liquid or powdery softening agent composition for washed textiles consisting essentially of

a. from 1 to 50% by weight of a quaternary allophanoylmethylammonium compound having the formula



wherein R_1 and R_2 are individually members selected from the group consisting of alkyl having 10 to 24 carbon atoms, alkenyl having 10 to 24 carbon atoms and alkadienyl having 10 to 24 carbon atoms, R_3 is a member selected from the group consisting of alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 1 to 4 carbon atoms and cyanoalkyl having from 1 to 4 carbon atoms, R_4 and R_5 are individually members selected from the group consisting of hydrogen and alkyl having 1 to 3 carbon atoms, and X^- represents the anion of an acid selected from the group consisting of inorganic acids and organic acids having 1 to 4 carbon atoms,

b. from 0 to 10% by weight of at least one nonionic surface-active dispersing agent selected from the group consisting of a water-soluble dispersing agent and a water-dispersible dispersing agent, and

c. the remainder up to 100% by weight of at least one diluent selected from the group consisting of water, and water-soluble or readily water-dispersible liquid carriers selected from the group consisting of alkanols having 1 to 5 carbon atoms, alkanones having 3 to 6 carbon atoms, and ethylene glycol and diethylene glycol and their monomethyl, dimethyl, monoethyl and diethyl ethers, and solid, inert, water-soluble or readily water-dispersible inorganic and organic compound carriers.

3,919,092

POLYALKENEOXIDE AND POLYSACCHARIDE GUM DERIVATIVES MOBILITY CONTROL AGENT AND PROCESS

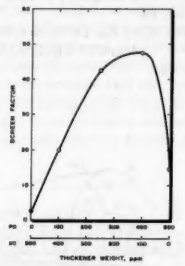
Charles J. Norton, and David D. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 133,060, April 12, 1971. This application Feb. 26, 1973, Ser. No. 335,970

Int. Cl.² E21B *43/16*

U.S. Cl. 252—8.55 D **5 Claims**

1. Compositions consisting essentially of aqueous solutions of about 1 to about 5000 parts per million of water soluble polyethylene oxide having molecular weights in the range of from about 10^5 to about 10^8 and about 1 to about 5000 parts per million of water soluble polysaccharide gum derivatives



BLENDS OF POLYETHYLENE OXIDE (PO) AND KELZAN (XC) IN WATER EXHIBIT SYNERGISM ON SCREEN FACTOR.

produced by fermentation of carbohydrates by Xanthomonas bacteria.

3,919,093

LUBRICANT COMPOSITIONS CONTAINING ALKYLENE OXIDE POLYMERS AND SULFUR

Robert H. Davis, Pitman; Edward A. Oberright, Woodbury, and John W. Schick, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,645

Int. Cl.² C10M *3/06*

U.S. Cl. 252—31 **15 Claims**

1. A lubricant composition containing an anti-wear amount of a mixture of an alkylene oxide polymer and sulfur.

3,919,094

ADDITIVES FOR LUBRICANTS AND MOTOR FUELS

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 6, 1974, Ser. No. 503,946

Int. Cl. C10m *1/40*

U.S. Cl. 252—33 **10 Claims**

1. A lubricating oil composition comprising a major proportion of a lubricating oil containing a small but effective amount, sufficient to impart decreased detergency to said lubricating oil, of an oil-soluble dispersant additive which is the reaction product obtained upon reacting

a. a petroleum sulfonic acid with

b. an adduct formed for

1. at least one amine selected from primary monoamines having from 2 to 10, inclusive, carbon atoms, and polyamines represented by the formula $H_2N[(CH_2)_xNH]_yH$ wherein x is an integer of from 2 to 6 and y is an integer of from 1 to 10, and

2. at least one aldehyde having from 2 to 12, inclusive, carbon atoms.

3,919,095

ORGANIC COMPOSITIONS CONTAINING ANTIOXIDANT AND ANTIWEAR ADDITIVES

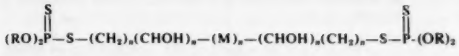
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 30, 1973, Ser. No. 383,875

Int. Cl.² C10M *1/48*

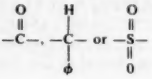
U.S. Cl. 252—46.6 **14 Claims**

1. An organic composition selected from the group consisting of lubricating oils, greases and liquid hydrocarbon fuels, containing, in an amount sufficient to increase oxidative resistance and antiwear properties, a compound having the following structure:



in which

R is alkyl, aryl, alkaryl, aralkyl or cycloalkyl; M is



n is zero or a whole number and at least one *n* is a whole number.

3,919,096

COMBINATION OF BENZOTRIAZOLE WITH OTHER MATERIALS AS EP AGENTS FOR LUBRICANTS

William Frank Olszewski, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,669
Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—46.7 **9 Claims**

1. A lubricant composition containing a major proportion of a mineral oil, a synthetic hydrocarbon fluid, a synthetic ester lubricating oil or a grease made therefrom and an extreme pressure amount of the additive mixture comprising a dihydrocarbyl phosphonate, a sulfurized alkylene monomer and benzotriazole.

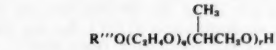
3,919,097

LUBRICANT COMPOSITION

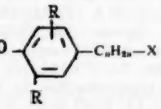
Kisoon Park, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,686
Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—48.6 **12 Claims**

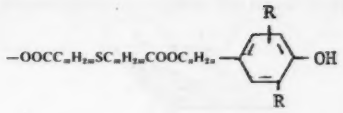
1. A lubricant composition comprising (A) a major amount of a random or block copoly(oxyethylene-oxypropylene) glycol or monoether thereof of the structure



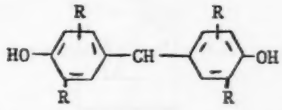
wherein R''' is hydrogen or alkyl of from 1 to 12 carbon atoms; *q* and *r* are integers such that *q* comprises from 25 to 75 weight percent of the sum of *q* plus *r*, and wherein said glycol or monoether has a number average molecular weight of from 500 to 30,000; (B) from 0.1 to 5 weight percent of a stabilizer of the structure:



wherein R is (i) alkyl of 1 to 6 carbon atoms when X is —COOR' or

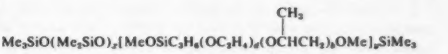


or (ii) hydrogen or alkyl of 1 to 6 carbon atoms when X is



R' is alkyl of from 6 to 22 carbon atoms; *n* and *m* are integers of from 2 to 4; (C) from 2 to 35 weight percent of a coupling agent of the structure:

wherein R'' is alkyl of from 8 to 22 carbon atoms; phenyl or alkylphenyl wherein said alkyl group has from 1 to 18 carbon atoms; and p is an integer of from 3 to 40; (D) from 0.5 to 2.5 weight percent of a bulk wetting agent of the random structure:



in which Me is methyl, x is from 15 to 100, d is from 5 to 30, b is from 0 to 50, and y is from 2.5 to 7.5; and (E) from zero to 10 weight percent of a corrosion inhibitor.

3,919,098

CUTTING OIL OF REDUCED STRAY FOG

Klaus H. Altgelt, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 5, 1973, Ser. No. 413,150
Int. Cl.² C10M *1/16*
U.S. Cl. 252—59 **10 Claims**

1. A composition of matter having metal working properties comprising a major portion of a hydrocarbon oil having a viscosity of 50 to 500 SUS at 100°F and from 0.0001 to 2 weight percent of an antifog additive selected from polyisobutene, poly n-butene or mixtures thereof, having a viscosity average molecular weight ranging from 0.3 to 10 million.

3,919,099

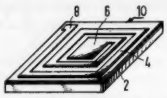
BARIUM TITANATE CERAMIC DIELECTRIC ELEMENT

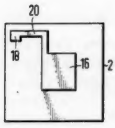
Erich Fenner, Gauting, and Renate Kuschke, Forstinning, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1973, Ser. No. 400,330
Claims priority, application Germany, Sept. 29, 1972, 2247978
Int. Cl.² H01B *3/00, 3/18*
U.S. Cl. 252—63.2 **9 Claims**

1. A ceramic dielectric element having a relatively low dependence of the dielectric constant on temperature over a given operating temperature range composed of a mixture including a major proportion of a barium titanate component,

about 0.5 to 5% by weight of an iron component, and about 0.1 to 5% by weight of a further component composed of a





material selected from the group consisting of nickel and zinc, said components being calculated as their respective oxides.

3,919,100
ALKALINE ETCHANT COMPOSITIONS

Frank A. Brindisi, Jr., Madison, Conn.; Jo Wynschenk, Glen Ellyn, Ill., and Theophil J. Wieczorek, West Haven, Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Filed Apr. 24, 1974, Ser. No. 463,709
Int. Cl.² C09K *13/00*
U.S. Cl. 252—79.1 **11 Claims**

1. A ready-to-use aqueous alkaline copper etchant solution comprising cupric ions supplied by a cupric ion source selected from the group consisting of cupric carbonate and cupric ammonium sulfate as an oxidant for copper, sulfamate ions for accelerating the etching of the copper, and ammonium ions for maintaining the pH of the etchant solution on the alkaline side of pH 7, the sulfamate ions being present in an amount (calculated as OSO_2NH_2) of at least 0.2 mole per liter but insufficient to result in an uncontrollable fast etching rate which results in significant undercutting of circuit lines in the preparation of additive-type printed circuit boards.

3,919,101
CARPET CLEANING COMPOSITION AND METHOD

Raymond Michael Anstett, Hazlet; Charles Edward Buck, Caldwell, and Victor Earl Sheaffer, Glen Gardner, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 20,398, March 17, 1970, abandoned. This application Apr. 5, 1973, Ser. No. 348,201
Int. Cl.² C11D *1/10, 3/14, 3/20*
U.S. Cl. 252—90 **9 Claims**

6. A pressurized aerosol package consisting essentially of a valved container having therein about 85–95 percent by weight of a concentrate and 15 to 5 percent by weight of a liquefied normally gaseous propellant, said concentrate consisting essentially of:

A. 4–15 percent by weight of the concentrate, of a water-soluble anionic, organic, surface active agent selected from the group consisting of 1) alkyl sulfates represented by the formula $ROSO_3X$ wherein R is an aliphatic hydrocarbon group containing 10 to 18 carbon atoms and X represents a cation selected from the group consisting of sodium, potassium, lithium, and ammonium; 2) alkoyl sarcosinates represented by the formula $R_1CON(CH_3)CH_2COOX$ wherein R_1 is an aliphatic hydrocarbon group containing from 9 to 18 carbon atoms and wherein X represents a cation selected from the group consisting of sodium, potassium, lithium, and ammonium; and 3) mixtures thereof;

B. 0.25 to 2 percent by weight of the concentrate, of an aliphatic C_{16}-C_{18} fatty alcohol;

C. 0.75 to 5 percent by weight of the concentrate, of a finely divided water insoluble siliceous material having an average particle size ranging from about 0.01 to about 2 microns;

and

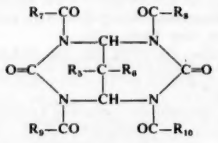
D. 65 to 95 percent by weight of the concentrate, of water.

3,919,102
COMPOSITION AND METHOD FOR ACTIVATING OXYGEN UTILIZING N-ACYLATED TETRAAZA-BICYCLO-NONANDIONES

Dieter Kühling, Monheim, and Helmut Bloching, Hilden, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Division of Ser. No. 235,032, March 15, 1972, Pat. No. 3,825,543. This application Dec. 7, 1972, Ser. No. 312,989
Claims priority, application Germany, Mar. 16, 1971, 2112557; Mar. 16, 1971, 2112678
Int. Cl.² C11D *3/26, 7/32;* **C01B** *15/00*
U.S. Cl. 252—99 **15 Claims**

9. Solid oxidation compositions for bleaching and washing agents consisting essentially of from 5% to 90% by weight of an activator N-acylated 2,4,6,8-tetraaza-bicyclo-(3,3,1)-nonan-3,7-dione of the formula



wherein each of the R_7CO, R_8CO, R_9CO and $R_{10}CO$ are the same acyl of organic carboxylic acids selected from the group consisting of alkanoic acids having 2 to 4 carbon atoms, haloalkanoic acids having 2 to 4 carbon atoms, benzoic acid, alkylbenzoic acids having 8 to 10 carbon atoms, halobenzoic acids, nitrobenzoic acids, nitrotoluic acids, and halotoluic acids, and R_5 and R_6 are members selected from the group consisting of two hydrogens and two methyls, from 95% to 10% by weight of at least one alkaline-reacting builder salt, from 0 to 15% by weight of a surface-active compound selected from the group consisting of anionic surface-active compounds, non-ionic surface-active compounds and amphoteric surface-active compounds, and from 0 to 10% by weight of percompound stabilizers.

3,919,103
TRICHLOROISOCYANURIC ACID STABILIZED WITH HYDRATED SODIUM DICHLOROISOCYANURATE

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 309,599, Nov. 24, 1972, abandoned. This application May 2, 1973, Ser. No. 356,350
Int. Cl.² C11D *3/395, 7/54;* **D06L** *3/00*
U.S. Cl. 252—187 C **3 Claims**

1. A chlorine dry bleach containing as its essential ingredients trichloroisocyanuric acid and hydrates of sodium dichloroisocyanurate as a chemical stabilizer therefor at least about 1% by weight of the composition.

3,919,104
CATALYST FOR THE SETTING OF AN ACID-SETTABLE LIQUID IN A TERRESTRIAL ZONE

Patrick H. Hess, Diamond Bar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 273,256, July 19, 1972, Pat. No. 3,850,249. This application Nov. 23, 1973, Ser. No. 418,625
Int. Cl.² B01J *31/02;* **C09K** *3/00*
U.S. Cl. 252—188.3 R **2 Claims**

1. The composition suitable for use as a catalyst for the setting of an acid-settable organic liquid consisting essentially

of a mixture of an acid-releasing component and a basic component, said mixture containing an amount of the base in the range 0.02 to 0.98 equivalent per equivalent of releasable strong acid from the acid-releasing component, said acid-releasing component being one or more compounds of the formula $AR(CX_3)_m(Y)_n$ in which:

a. AR is benzene or naphthalene ring less m+n hydrogen atoms;
b. X is a halide selected from the group consisting of chloride, bromide and iodide;
c. Y is an inert substituent selected from the group consisting of chloride, bromide, alkoxide, $NaOSO_2$—, $KOSO_2$—, NH_4OSO_2—, and alkyl;
d. n is 0, 1 or 2; and
e. m is 1 or 2;

said basic component is one or more compounds of the formula $ARN(Z)_m$ in which:

a. ARN is pyridine, quinoline or isoquinoline less m hydrogen atoms;
b. Z is an inert substituent selected from the group consisting of chloride, bromide, alkyl and phenyl; and
c. m is 0, 1 or 2;

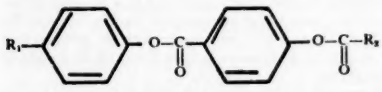
and said compounds have a carbon atom content which is less than 21.

3,919,105
NEMATIC LIQUID CRYSTAL COMPOSITIONS EXHIBITING POSITIVE DIELECTRIC ANISOTROPY

Yoshio Katagiri, Tokyo, and Yoshio Miyata, Ageo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Seikosha, both of, Japan

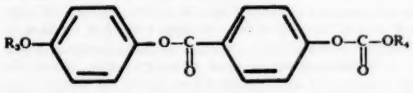
Filed June 5, 1973, Ser. No. 367,249
Claims priority, application Japan, June 7, 1972, 47-55996
Int. Cl.² C09K *3/34*
U.S. Cl. 252—299 **8 Claims**

1. Nematic liquid crystal compositions exhibiting positive dielectric anisotropy comprising a nematic liquid crystal component and an orienting component, said nematic liquid crystal component essentially consisting of a mixture of liquid crystal compounds having negative dielectric anisotropy having the formula



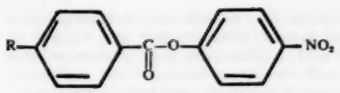
I

where R_1 represents alkyl group of 2–4 carbon atoms and R_2 represents an alkyl or alkoxy group of 3–10 carbon atoms; with a liquid crystal compound having negative dielectric anisotropy having the formula

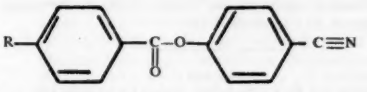


II

where R_3 is an alkyl group of 1–10 carbon atoms and R_4 is an alkyl group of 3–10 carbon atoms;
and said orienting component is selected from the group consisting of strongly positive orienting compounds having the formulae



III



IV

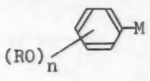
where R is an n-alkyl group of at least 3 carbon atoms.

3,919,106
LIQUID CRYSTAL DISPLAY DEVICE

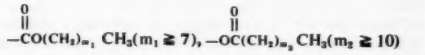
Komei Asai, Hiraka; Akio Moriyama; Hiroshi Tatsuta, both of Katano, and Masakazu Fukai, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 15, 1974, Ser. No. 460,874
Claims priority, application Japan, Apr. 20, 1973, 48-45374; Apr. 20, 1973, 48-45377; Apr. 20, 1973, 48-45378
Int. Cl.² C09K *3/34*
U.S. Cl. 252—299 **4 Claims**

1. A liquid crystal display device comprising a liquid crystal material having homeotropic structure which is comprised of a nematic liquid crystal and at least one of the compounds having the following general formula:



wherein M is a member selected from



and

—OR is an alkoxy group, n is 1, 2 or 3 and said group —OR is at the para-position to M when $n = 1$, at the metapositions to M when $n = 2$ and at the meta- and para-positions to M when $n = 3$.

3,919,107
BUILT DETERGENT COMPOSITIONS CONTAINING DEXTRIN ESTERS OF POLY CARBOXYLIC ACIDS

James Edwin Thompson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 23, 1973, Ser. No. 344,465
Int. Cl.² C11D *1/08*
U.S. Cl. 252—99 **10 Claims**

1. A detergent composition, consisting essentially of
a. from about 5% to about 95% by weight of a water-soluble organic surface-active agent selected from the group consisting of anionic, nonionic, ampholytic and zwitterionic detergents and mixtures thereof; and
b. from about 95% to about 5% by weight of a water-soluble builder consisting of dextrin esterified with a polycarbox-

ylic acid selected from mellitic acid, benzene pentacarboxylic acid, benzene tetracarboxylic acid, benzene tricarboxylic acid, oxydisuccinic acid, carboxymethyloxysuccinic acid, furan tetracarboxylic acid, and tetrahydrofuran tetracarboxylic acid, said builder being characterized by a degree of substitution from about 0.2 to 3 and a degree of esterification of 1; the weight ratio of the surface-active agent to the builder being in the range from about 20:1 to about 1:15.

3,919,108
METHOD OF PREVENTING DEGRADATION OF YTTRIUM OXIDE PHOSPHOR

Harold D. Wilcox, Elmira, N.Y.; Douglas A. Griswold, Blossburg, Pa., and Himanshu M. Patel, Horseheads, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1974, Ser. No. 523,941

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.3 R **3 Claims**

1. Method of preventing degradation of yttrium oxide phosphor in an aqueous slurry containing dichromate ion, which method comprises adding an ammonium polycarboxylate selected from the group consisting of ammonium oxalate, ammonium citrate and ammonium tartrate in an amount of at least 0.5 weight percent of the phosphor weight, to the slurry.

3,919,109
PROCESS FOR PREPARING SUBSTITUTED HALOPHOSPHATE PHOSPHORS

Herbert J. Kauders, Euclid, and Thomas C. Vincent, Mayfield Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 13, 1974, Ser. No. 469,355

Int. Cl.² C09K *11/10, 11/12, 11/16, 11/24, 11/42, 11/44*

U.S. Cl. 252—301.6 P **2 Claims**

1. A process of reducing cadmium loss by emission during the manufacture of a calcium halophosphate phosphor having the general formula

$3\,Ca_3(PO_4)_2 \cdot CaX_2$:Mn,Sb

wherein a portion of the calcium ion has been replaced by cadmium ion, and X is a halogen ion including a mixture of fluorine and chlorine, said phosphor having a ratio of the total calcium, cadmium and manganese cations to phosphate anion of 9.75/6 to 9.97/6 which comprises firing a raw phosphor forming ingredient mixture devoid of a cadmium source comprising $CaHPO_4$, $CaCO_3$, CaF_2, NH_4Cl, $MnCO_3$ and Sb_2O_3 at a temperature of 1100°–1200°C, blending 0.5–7.1% by weight of a cadmium phosphate compound selected from the group consisting of cadmium pyrophosphate and cadmium ammonium phosphate into the fired mixture and then firing said fired mixture and cadmium phosphate compound at a temperature of 900°–1150°C in an inert atmosphere for a sufficient time to produce an efficient phosphor with a minimum loss of cadmium.

3,919,110
COLORED ORGANIC SYNTHETIC PIGMENTS AND METHOD FOR PRODUCING SAME

Anthony E. Vassiliades, Deerfield; Edward F. Nauman, Schaumberg, both of Ill., and Shrenik Shroff, Bombay, India, assignors to Champion International Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 87,654, Nov. 6, 1970, Pat. No. 3,707,514, which is a continuation-in-part of Ser. No. 786,337, Dec. 23, 1968, Pat. No. 3,585,149. This application Nov. 8, 1972, Ser. No. 304,646. The portion of the term of this patent subsequent to June 13, 1989, has been disclaimed.

Int. Cl.² B01J *13/02*; C08J *9/00*; C09C *1/00*

U.S. Cl. 252—316 **20 Claims**

1. Colored, synthetic, organic pigments consisting essentially of discrete, substantially spherical, air-containing microcapsules having an average particle diameter below about two microns, said microcapsules having substantially continuous, organic, polymeric, solid walls having a dye material incorporated therein.

11. A method for the production of discrete, colored, synthetic pigments which comprises providing substantially spherical, precursor microcapsules having substantially continuous, organic, polymeric, solid walls and an oily core material containing a member selected from the group consisting of non-white oil-dispersible pigments, oilsoluble dyes, and water-soluble dyes, said precursor microcapsules having an average particle diameter below about two microns, and heating said microcapsules to a temperature sufficient to substantially completely drive off said oily core material from said microcapsules in order to provide air-containing, colored pigments.

3,919,111
AGENTS AND METHOD FOR FOAM CONTROL

Rudi Heyden, Hochdahl-Millrath, and Michael Eckelt, Dusseldorf-Benrath, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Feb. 28, 1973, Ser. No. 336,601

Claims priority, application Germany, Feb. 29, 1972, 2209559

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 **6 Claims**

1. Anti-foaming composition consisting essentially of from 5 to 15% by weight of said composition of an ester of hydroxystearyl alcohol selected from the group consisting of monoesters and diesters with an acid selected from the group consisting of saturated fatty acids having from 16 to 24 carbon atoms and saturated hydroxy fatty acids having from 16 to 24 carbon atoms, and optionally having a further content of another active de-foamer compound wherein the ratio of said ester of hydroxystearyl alcohol to said another active de-foamer compound if present is from 60:40 to 80:20 by weight, said another active de-foamer compound being selected from the group consisting of an adduct of 2 mols of ethylene oxide and 4 mols of propylene oxide to isotridecyl alcohol and a polyethylene glycol ester with stearic acid having a molecular weight of from 5000 to 10,000, finely dispersed in a liquid selected from the group consisting of inert organic liquids, liquid in the range of from 15° to 140°C and water, with the proviso that the total amount of de-foamers is from 5 to 15% by weight of said composition.

6. In the process for the control of foam in foamable liquids comprising adding an effective amount of a waxy de-foamer dispersion in an organic liquid or water, the improvement consisting of utilizing, as said waxy de-foamer, from 5 to 15% by weight of said dispersion of a finely dispersed ester of hydroxystearyl alcohol selected from the group consisting of monoesters and diesters with an acid selected from the group consisting of saturated fatty acids having from 16 to 24 carbon atoms and saturated hydroxy fatty acids having from 16 to 24 carbon atoms, and optionally having a further content of another active de-foamer compound wherein the ratio of said ester of hydroxystearyl alcohol to said another active de-foamer compound is from 60:40 to 80:20 by weight, said another active de-foamer compound being selected from the group consisting of an adduct of 2 mols of ethylene oxide and 4 mols of propylene oxide to isotridecyl alcohol and a polyethylene glycol ester with stearic acid having a molecular weight of from 5000 to 10,000, with the proviso that the total amount of defoamer is from 5 to 15% by weight of said dispersion.

3,919,112

COMPOSITION TO EMULSIFY MINERAL OIL PRODUCTS IN BIODEGRADABLE FORM

Pierre Fusey, Paris, France, assignor to Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi", Paris, France

Filed Feb. 13, 1973, Ser. No. 332,087

Claims priority, application France, Feb. 22, 1972, 72.05893

Int. Cl.² B01F *17/00*

U.S. Cl. 252—352 **6 Claims**

1. A composition to emulsify mineral oil products in a form biodegradable by micro-organisms consisting essentially of a mixture of 100 parts by weight of a vinasse, 6 to 20 parts by weight of a fatty acid selected from the group consisting of oleic acid, caproic acid, caprylic acid and octoic acid, and 8 to 20 parts by weight of a basic substance selected from the group consisting of ammonia, potash lye, soda lye and basic salt.

3,919,113

OXO-SYNTHESIS GAS

Blake Reynolds, Riverside, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 878,725, Nov. 21, 1969, Pat. No. 3,723,344. This application Nov. 20, 1972, Ser. No. 308,199. The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl.² C07C *1/02*

U.S. Cl. 252—373 **11 Claims**

1. A process for simultaneously producing a stream of oxo-synthesis gas having a comparatively high mole ratio (CO/H_2) and a separate stream of methanol synthesis gas having a compartively low mole ratio (CO/H_2) which comprises subjecting a hydrocarbon fuel to partial oxidation with oxygen in a gas generating zone to produce a stream of effluent gas comprising CO and H_2 and having a temperature in the range of 2,000° to 3,000°F., mixing together a first portion of said effluent gas stream from said gas generating zone with a stream comprising supplemental carbon dioxide so as to produce a water-gas reverse shift feedstream, reacting said water-gas reverse shift feedstream in a noncatalytic adiabatic water-gas reverse shift conversion zone to produce a stream of oxo-synthesis gas having a temperature in the range of about 1,500° to 2,800°F. and having a mole ratio (CO/H_2) which is greater than the mole ratio (CO/H_2) of the effluent gas stream from said gas generating zone; separately mixing together a second portion of said effluent gas stream from said gas generating zone with a stream of supplemental steam of form a water-gas direct shift feedstream, and reacting said water-gas direct shift feedstream in a noncatalytic adiabatic water-gas direct shift conversion zone to produce a stream of methanol synthesis gas having a temperature in the range of about 1,500° to 2,800°F. and having a mole ratio (CO/H_2) which is less than the mole ratio (CO/H_2) in said effluent gas stream from said gas generating zone.

3,919,114

SYNTHESIS GAS PROCESS

Blake Reynolds, Riverside, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 878,725, Nov. 21, 1969, Pat. No. 3,723,344, and Ser. No. 878,728, Nov. 21, 1969, Pat. No. 3,723,345. This application Nov. 24, 1972, Ser. No. 309,316. The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl.² C07C *1/02*

U.S. Cl. 252—373 **9 Claims**

1. A process for producing gaseous mixtures comprising carbon monoxide and hydrogen while controlling the mole ratio (CO/H_2) of the product gas comprising

1. producing an effluent gas mixture comprising principally carbon monoxide and hydrogen by subjecting a hydrocarbon fuel to partial oxidation with a free-oxygen containing gas and optionally with a temperature moderator selected from the group consisting of H_2O, CO_2, a cooled portion of the product gas, cooled off-gas from an integrated ore reduction zone, nitrogen, and mixtures thereof in a free-flow noncatalytic partial oxidation gas generating zone at an autogenous temperature in the range of about 1700° to 3500°F., and a pressure in the range of about 1 to 350 atmospheres,
2. cooling and mixing the gas mixture from (1) with a supplemental material selected from the group consisting of H_2O and CO_2 so as to produce a gas mixture having a temperature less than 1500°F.,
3. increasing the temperature of the gas mixture from (2) to at least 1500°F., and
4. reacting in a separate unpacked free-flow noncatalytic water-gas shift conversion zone at a temperature of at least 1500°F., the gas mixture from (3) to produce a product gas mixture comprising carbon monoxide and hydrogen having a mole ratio (CO/H_2) which is less than the effluent gas mixture from (1) when said supplemental material selected in (2) is H_2O, and having a mole ratio (CO/H_2) which is greater than the effluent gas mixture from (1) when said supplemental material selected in (2) is CO_2.

3,919,115

FLUIDIZED CATALYST REGENERATION PROCESS

Laurence O. Stine, Western Springs, and Algie J. Conner, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 263,399, June 8, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454.629. The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² B01J *37/12;* **C10G** *35/00*

U.S. Cl. 252—417 **5 Claims**

1. A process for the regeneration of a zeolite-containing or an amorphous coke-contaminated spent hydrocarbon cracking catalyst, removed from a reaction zone, and the conversion of carbon monoxide, resulting from the oxidation of coke from said catalyst, to carbon dioxide, wherein the residual coke on the regenerated catalyst is directly controllable which process is operated within a pressure range from about normal atmospheric to about 50 psig. and comprises the steps of:

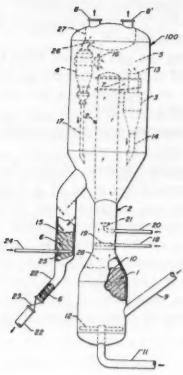
a. passing said catalyst and a fresh free oxygen-containing regeneration gas in a controlled amount to a first dense bed of fluidized particulate catalyst in a regeneration zone and oxidizing coke in said first dense bed maintained at oxidizing conditions including a temperature within the range of about 1250° F. to about 1400° F., a superficial gas velocity within the range of about 3 to about 10 feet per second, and a catalyst residence time of less than two minutes;

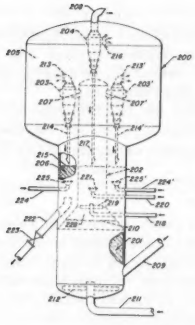
b. controlling the amount of fresh free oxygen-containing regeneration gas of step (a) passed into said dense bed to oxidize said coke to a predetermined residual coke level, to produce regenerated catalyst having a desired residual coke level and partially spent regeneration gas containing CO;

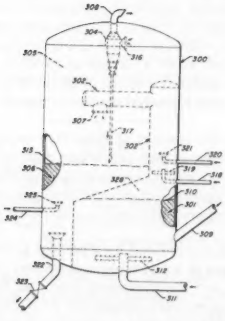
c. passing said regenerated catalyst and partially spent regeneration gas to a dilute phase transport riser communicating with and superimposed over said frist dense bed and therein essentially completely converting CO to CO_2 at conversion conditions including a temperature within the range of about 1275° F. to 1475° F., a superficial gas velocity within the range of about 10 to 25 feet per second, and a residence time which precludes further substantial oxidation of residual coke and additional production of CO, to produce spent regeneration gas;

d. separating the thus-regenerated catalyst from said spent

regeneration gas; and,







e. introducing said regenerated catalyst to a second dense bed of particulate material, from which said regenerated catalyst is returned to said reaction zone.

3,919,116
PHOSPHATIC CATALYST FOR THE DEHYDROGENATION OF OLEFINS AND ALKYLATED AROMATIC HYDROCARBONS AND METHOD OF PREPARING SAME

Georgy Romanovich Kotelnikov, Gorodskoi val, 16, kv. 74; Stanislav Fedorovich Bednov, ulitsa Em. Yaroslavskogo, 114; Boris Vasilievich Sirotkin, 1 Zhilaya ulitsa, 6, kv. 23; Alexandr Nikitich Bushin, ulitsa Pervomaiskaya, 9, kv. 21, all of Yaroslavl; Roman Alexeevich Buyanov, ulitsa Zhemchuzhnaya 8, kv. 20, Novosibirsk; Ljudmila Viktorovna Strunnikova, 1 Leningradsky proezd, 11, kv. 75, Yaroslavl; Mikhail Mikhailovich Andrushkevich, ulitsa Tereshkovoi, 6, kv. 157, Novosibirsk; Nikolai Alexandrovich Karnaev, ulitsa Zasulich, 3, kv. 28, Sverdlovsk; Andrian Petrovich Troitsky, 3 Cheremushkinskaya ulitsa, 18, korpus 2, kv. 53, Moscow; Yakov Yakovlevich Kirnos, Uglichskoe shosse, 10, kv. 54, Yaroslavl; Tamara Mikhailovna Ivanitskaya, ulitsa Vainera, 3, kv. 55, Sverdlovskaya oblast, Pervouralsk; Alexandr Nikolaevich Shishkin, ulitsa Chkalova, 76, kv. 38, Yaroslavl; Vladimir Ivanovich Ponomarenko, ulitsa Yakutova, 22; Nickolai Yakovlevich Eremenko, ulitsa Odesskaya, 31, both of Sterlitomak; Vadim Alexandrovich Dultsev, ulitsa Uritskogo, 55, kv. 38, Yaroslavl; Alexandr Grigorievich Liakumovich, prospekt Lenina, 23, kv. 4, Sterlitomak; Gennady Arkadievich Stepanov, ulitsa Pervomaiskaya, 9, kv. 3, Yaroslavl, and Valerian Mikhailovich Sobolev, naberezhnaya M. Gorkogo, 46/50, kv. 85, Moscow, all of U.S.S.R.

Filed May 17, 1973, Ser. No. 361,155
Int. Cl.[2] B01J *27/18*
U.S. Cl. 252—437 **12 Claims**

1. A phosphatic catalyst for the dehydrogenation of olefins and alkylaromatic hydrocarbons consisting essentially of calcium, nickel and chromium phosphates and the oxide of an element selected from the group consisting of titanium and zirconium, the elemental composition of the catalyst in percent by weight being as follows: calcium, 20–40; nickel, 3–6; chromium, 0.5–5; titanium, 0.5–5 or zirconium, 0.1–15; and phosphorus, 15–23.

3,919,117
METHOD OF PREPARING ALUMINA SPHERES

Edward Michalko, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 18, 1974, Ser. No. 452,482
Int. Cl.[2] B01J *37/00*
U.S. Cl. 252—448 **6 Claims**

1. In the preparation of alumina spheres wherein an acidic alumina sol is dispersed as droplets in a hot oil bath in which the sol droplets are gelled and aged, the improvement of removing the aged spheres from the oil bath and then further aging the same in an aqueous ammonium carbonate solution at a temperature of from about 20° to about 50° C., and thereafter washing, drying and calcining the alumina spheres.

3,919,118
PROCESS FOR DESULFURIZING CHAR

Leon Robinson, Upland, and Hans F. Bauer, Diamond Bar, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Sept. 27, 1973, Ser. No. 401,408
Int. Cl.[2] C10B *57/00*; C01B *31/02*
U.S. Cl. 423—461 **11 Claims**

1. A process for reducing the sulfur content of char comprising the steps of:

a. admixing char with a basic molten bath comprising an alkaline salt formed from

1. an organic acid comprising the cresylic acid fraction from the distillation of coal tar, and
2. a caustic material selected from the group consisting of alkali metal, and alkaline earth metal, oxides, hydroxides, carbonates, acetates or mixture thereof, wherein

the ratio of the moles of said caustic material to the moles of said cresylic acid is greater than about one;

b. maintaining said bath in a molten condition until sulfur in the char is leached therefrom, and

c. separating said char of reduced sulfur content from the molten bath.

3,919,119
ATTRITION-RESISTANT TITANIUM CATALYST CARRIER AND METHOD OF MAKING SAME

Andrzej Antoni Florian Romanski; Derek John Brookes, both of Sheffield; Anthony Smith, Rotherham, and Harry Markham, Sheffield, all of England, assignors to British Steel Corporation (Chemicals) Limited, London, England

Filed June 3, 1974, Ser. No. 475,908

Claims priority, application United Kingdom, June 4, 1973, 26483/73

Int. Cl.² B01J *21/06*

U.S. Cl. 252—461 **8 Claims**

1. A method of producing a hard attrition-resistant catalyst carrier comprising mixing a titanium chelate with titanium dioxide in powder form and a gelling agent, allowing the mixture to gel and then drying and calcining the gelled mixture at a temperature above 500°C.

3,919,120
CATALYST COMPOSITION AND A METHOD FOR PRODUCTION THEREOF

Masayoshi Kato, Hoya; Yoshiyuki Eto, Yokosuka; Tadashi Ikemi, Yokohama, and Chinami Matsumoto, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 19, 1972, Ser. No. 316,546

Claims priority, application Japan, Jan. 18, 1972, 47-7365

Int. Cl.² B01J *23/44*, *23/74*

U.S. Cl. 252—466 B **4 Claims**

1. A method of preparing a catalyst for use in treatment of exhaust gases containing carbon monoxide, hydrocarbons and nitrogen oxides, said method comprising the steps of: mixing together nickel hydroxide in powder form, activated alumina in powder form and alumina sol; moulding the mixture into a suitable form; immersing the mould in a solution of a palladium salt selected from the group consisting of palladium nitrate, palladium bromide, palladium chloride, palladium sulfate; sintering the resultant mould at a temperature of 700° to 800°C to give a catalyst containing nickel oxide and palladium oxide, the nickel being contained in an amount of from 0.05 to 3.0 moles and the palladium in an amount of from 0.0003 to 0.1 moles, when calculated as metals, per liter of carrier components, both in oxide form.

3,919,121
METHOD FOR PRECIPITATING PLATINUM METAL ON A SUPPORT

Ronald F. Davies, Elkton, Md., and George J. Benvegno, Aston, Pa., assignors to Colonial Metals, Inc., Elkton, Md.

Division of Ser. No. 348,075, April 5, 1973. This application June 14, 1974, Ser. No. 479,204

Int. Cl.² B01J *21/04*, *23/56*

U.S. Cl. 252—466 PT **8 Claims**

1. A method for precipitating platinum metal onto support pads, comprising applying an aqueous solution of a mixture of chloroplatinic acid, dextrose, triethanolamine, and a high surface area refractory to the pads and heating the pads to precipitate platinum metal onto the pads.

3,919,122
MANUFACTURE OF RESINOUS COMPOSITIONS HAVING HIGH ELECTROCONDUCTIVITY

Reuben A. Tigner, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 12, 1973, Ser. No. 331,508

Int. Cl.² H01B *1/06*

U.S. Cl. 252—512 **14 Claims**

1. A method for manufacturing an electroconductive resinous composition which comprises (1) incorporating into a poorly conductive resinous material having a volume resistivity greater than 10^6 ohm-cm; a copper metal-containing particulate solid, wherein copper metal constitutes at least 50 volume percent of the solid if copper metal is distributed throughout the solid and at least 10 volume percent if the copper metal forms an essentially continuous layer covering the particle surfaces of the solid, a reactive metal selected from the group consisting of zinc, silver, alkali metals, calcium, and lead and a halide source containing bromide or chloride which will react with the reactive metal to convert the metal to a stable oxidized state and (2) reacting the halide source with the reactive metal whereby the resinous composition having a volume resistivity less than 10^4 ohm-cm is formed.

3,919,123
RESISTORS FOR IGNITION PLUGS

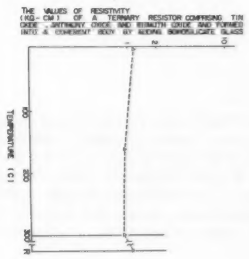
Osami Kamigaito; Hideyuki Masaki; Masami Oki, all of Nagoya; Masatosi Suzuki, Kariya, and Yasuo Nakamura, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan

Filed Oct. 15, 1973, Ser. No. 406,340

Claims priority, application Japan, Nov. 1, 1972, 47-109724

Int. Cl.² H01B *1/06*

U.S. Cl. 252—518 **6 Claims**



1. A resistor for an ignition plug consisting of 50 to 90 percent by weight of a resistance material and 50 to 10 percent by weight of low melting glass, the resistance material comprising 4 to 22 percent by weight of bismuth oxide, 70.2 to 95 percent by weight of tin oxide, and 0.8 to 9.6 percent by weight of antimony oxide, the components of said resistance material being adhered together and hardened into a coherent solid body by said low softening glass.

3,919,124
X-RAY TUBE ANODE

Rudolf Friedel, Erlangen, and Richard Lauterbach, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 15, 1973, Ser. No. 323,639

Claims priority, application Germany, Jan. 17, 1972, 2201979

Int. Cl.² H01J *35/12*

U.S. Cl. 252—520 **3 Claims**

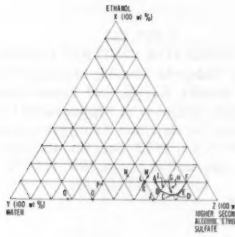
1. An anode for an X-ray tube, having a zone available for electron bombardment and, distinct from said zone, an exter-

nal layer of black material comprising the reaction product obtained by heating a mixture containing not less than 20 percent of titanium dioxide and at least one of the refractory oxides, aluminum oxide and calcium oxide.

3,919,125
METHOD OF PREPARING A HIGHLY CONCENTRATED SOLUTION OF A HIGHER SECONDARY ALCOHOL ETHOXYSULFATE AND SUCH A CONCENTRATED SOLUTION

Yoshiro Ashina; Takeshi Narita, and Hiroshi Murata, all of Yokohama, Japan, assignors to Nippon Unitol Co., Ltd. and Nitto Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed May 23, 1973, Ser. No. 362,985
Claims priority, application Japan, May 23, 1972, 47-50359
Int. Cl.² C11D *1/29, 3/43, 17/08*
U.S. Cl. 252—551 **7 Claims**



1. A method of preparing a concentrated solution of one or more sodium salts of higher secondary alcohol ethoxysulfate having a viscosity of 2000 centipoises or less at 25°C characterized in that a higher secondary alcohol ethoxysulfate obtained by adding 1 to 8 mols of ethylene oxide to 1 mol of higher secondary linear alcohol and sulfating the obtained adduct, which higher secondary linear alcohol has a general formula

$$CH_3-(CH_2)_n-\underset{\displaystyle OH}{\underset{|}{CH}}-(CH_2)_m-CH_3,$$

in which $n+m+3=10$ to 16, where n and m are integers, an aqueous solution of a caustic soda and ethanol are fed into a neutralization vessel to neutralize the higher secondary alcohol ethoxysulfate, the neutralization being conducted at a pH of 8± about 0.5, so that the three components of ethanol (X), water (Y) and the resulting one or more sodium salts of higher secondary alcohol ethoxysulfate (Z) fall within the range surrounded by the lines connecting the following six points with each other on a triangular coordinate plot:

(A)	X = 10%	Y = 25%	Z = 65%
(B)	X = 5%	Y = 25%	Z = 70%
(C)	X = 3%	Y = 22%	Z = 75%
(D)	X = 4%	Y = 18%	Z = 78%
(E)	X = 6%	Y = 14%	Z = 80%
(F)	X = 10%	Y = 10%	Z = 80%

the percentages being % by weight.

7. A detergent composition comprising ethanol, water and one or more sodium salt(s) of higher secondary alcohol ethoxysulfate, said ethoxysulfate obtained by adding 1 to 8 mols of ethylene oxide to 1 mol of higher secondary linear alcohol and sulfating the obtained adduct, which higher secondary linear alcohol has a general formula

$$CH_3-(CH_2)_n-\underset{\displaystyle OH}{\underset{|}{CH}}-(CH_2)_m-CH_3,$$

in which $n+m+3=10$ to 16, where n and m are integers, said three components of ethanol (X), water (Y) and the sodium salts(s) of higher secondary alcohol ethoxysulfate (Z) falling within the ranges surrounded by the lines connecting the following six points with each other on a triangular coordinate plot:

(A)	X = 10%,	Y = 25%,	Z = 65%
(B)	X = 5%,	Y = 25%,	Z = 70%
(C)	X = 3%,	Y = 22%,	Z = 75%
(D)	X = 4%,	Y = 18%,	Z = 78%
(E)	X = 6%,	Y = 14%,	Z = 80%
(F)	X = 10%,	Y = 10%,	Z = 80%

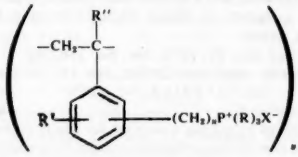
the percentages being % by weight of the three components, said detergent composition having a viscosity of 2000 centipoises or less at 25°C.

3,919,126
INSOLUBLE POLYALKYL PHOSPHONIUM SALT RESINS HAVING CROSSLINKED BACKBONE

Joseph W. Rakshys, Jr., Midland, Mich., and Suzanne V. McKinley, Wellesley, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 23, 1973, Ser. No. 390,830
Int. Cl.² C08F *230/00, 210/00*
U.S. Cl. 260—2.1 E **12 Claims**

1. An insoluble polymer having a carbon to carbon crosslinked backbone, said polymer having a plurality of



groups where R'' is H or a methyl group, R is a saturated unsubstituted aliphatic hydrocarbon group having from 1 to 10 C atoms, X is an OH^- or an OR''' group where R''' is a hydrocarbyl group of 1 to 10 C atoms free of aliphatic unsaturation, a CN^-, NO_3^-, $SO_4^=$, or a ClO_4^- group, R' is H, CN or one or more alkyl groups of 1 to 4 C atoms wherein the number of C atoms is not greater than 4, n is an integer of from 1 to 3, and y is an integer greater than 1 and constitutes from 20 to 99 mole percent of the polymer, from about 0.1 to about 30 mole percent being derived from a polyolefinic monomer and the remainder being derived from a monoolefinic monomer.

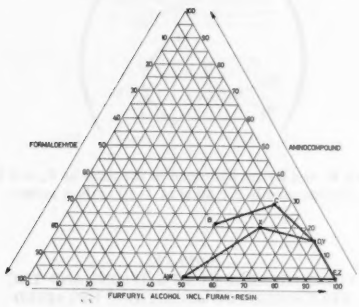
3,919,127
POLYFURAN FOAMS AND A METHOD OF PREPARING SAME

Hans-Ole Larsen, Hvidovre; Sven Barfoed, Copenhagen, both of Denmark, and John Arthur Gooch Gent, Liphook, England, assignors to Wolff & Kaaber, Farum, Denmark

Filed Aug. 14, 1973, Ser. No. 388,168
Claims priority, application United Kingdom, Aug. 25, 1972, 39707/72
Int. Cl.² C08J *9/14, 9/08*
U.S. Cl. 260—2.5 F **15 Claims**

1. A synthetic furfuryl alcohol polymer foam having a density of at least about 20 kg/m³ and substantially no exotherm at 200°C. comprising:

1. 100 parts by weight of the polymerization product, at least 50 parts by weight of which are derived from furfuryl alcohol, of (a) 10 to 75 parts by weight of a furfuryl alcohol resin, (b) 10 to 80 parts by weight of a urea-formaldehydefurfuryl alcohol resin in a molar ratio range of 1:1 to 10:0.5 to 12:0.5, and (c) the remainer being free furfuryl alcohol, polymerized in the presence of a strong acid catalyst and a blowing agent; and



2. up to 100 parts by weight of filler.

3,919,128

URETHANE-MODIFIED POLYISOCYANURATE FOAMS

James P. Baldino, Haddonfield, N.J., and Joseph Feltzin, Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 361,570, May 18, 1973, abandoned. This application July 23, 1974, Ser. No. 491,059

Int. Cl.[2] C08G *18/14*

U.S. Cl. 260—2.5 AW **10 Claims**

1. A fire-retardant, polyisocyanurate foam having a weight retention of greater than about 70 percent and a percent friability of about 60 percent or less, said foam comprising the reaction product of a composition comprising an organic polyisocyanate having a functionality equal to at least about 2.0 and a molecular weight equal to at least about 160, an isocyanurate catalyst, a blowing agent, a surfactant and a polyol, said polyol having the following formula:

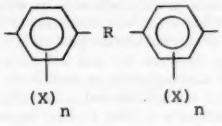
$$H(OR')_aO—A—O(R'O)_bH$$

wherein

R′ is an alkylene group containing from 2 to 4 carbon atoms or the radical $—CH_2CHO—$,

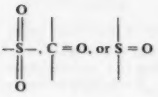
a and *b* are integers each of which is equal to at least 1 and the sum of which is equal to from about 4 to about 12, and

A is a radical having one of the following formulas



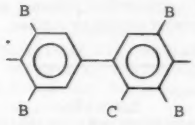
wherein

R is an alkylidene group containing from 1 to 4 carbon atoms, a cycloalkylidene group containing 5 or 6 carbon atoms, oxygen, sulfur or a radical having one of the following formulas:



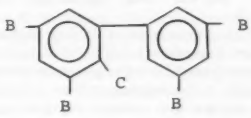
X is halogen or an alkyl radical containing from 1 to 3 carbon atoms, and

n is an integer equal to from 0 to 4;



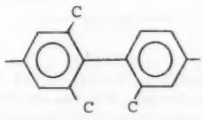
wherein

B is hydrogen or an alkyl group containing from 1–4 carbon atoms and C is hydrogen or halogen;



wherein

B and C are as defined above; and



wherein

C is hydrogen or halogen provided that at least 2 of the substituents are halogen;

provided that the amount of polyol is equal to less than the amount required to react with about 25 percent of the total isocyanate groups in said composition.

3,919,129

CERTAIN PHOSPHORUS ACID ESTERS

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

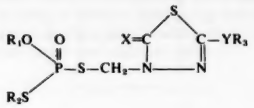
Filed Oct. 9, 1973, Ser. No. 404,570

Claims priority, application Switzerland, Oct. 6, 1972, 14695/72

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—302 E **12 Claims**

1. Compound of the formula



wherein

R_1 represents C_1-C_2-alkyl,

R_2 represents C_3-C_4-alkyl

R_3 represents C_1-C_5-alkyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_1-C_4-alkylthio-C_1-C_4-alkyl or C_3-C_4-alkenyl, and

X and Y each represent oxygen or sulphur.

3,919,130

TIRE TREAD COMPOSITIONS OF IMPROVED WET SKID RESISTANCE

Harvey L. Cohen, Matawan, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed June 3, 1974, Ser. No. 475,988

Int. Cl.² C08L *7/00, 23/20*

U.S. Cl. 260—4 **7 Claims**

1. A tire tread composition exhibiting improved wet skid resistance which comprises a blend of at least one general purpose rubber selected from the group consisting of natural rubber, synthetic polyisoprene, styrene butadiene rubber, polybutadiene rubber, and mixtures thereof, and at least 20 weight percent of an elastomeric copolymer, based on the copolymer plus general purpose rubber, of isobutylene and cyclopentadiene wherein said copolymer comprises about 20 to about 40 mole percent cyclopentadiene.

3,919,131

PERHALOGENATED CO-BUTYL RUBBER

Alberto Malatesta, Brussels, Belgium, and Francis P. Baldwin, Summit, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 22, 1972, Ser. No. 317,716. The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.

Int. Cl.² C08C *19/14;* **C08L** *7/00, 9/00, 15/02*

U.S. Cl. 260—5 **50 Claims**

1. A composition of matter consisting essentially of a perhalogenated butyl rubber consisting of a copolymer having from 85 to 99.5% by weight of an isoolefin having from 4 to 7 carbon atoms, combined with 15 to 0.5% by weight of a conjugated diolefin having from 4 to 14 carbon atoms (referred to hereinafter as butyl rubber), containing in the linear backbone substantially randomly inserted diolefin units having residual unsaturation and at least two halogen atoms attached thereto.

3,919,132

ACCELERATOR COMBINATIONS COMPRISING THIOPEROXYDIPHOSPHATE AND BIS (TRIAZINYL) DISULFIDES

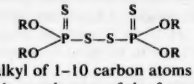
Chester D. Trivette, Jr.; John P. Vanderkooi, both of Akron, and Ralph A. Genetti, Copley, all of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 3, 1973, Ser. No. 421,125

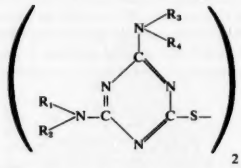
Int. Cl.² C08K *5/34;* **C08J** *3/24*

U.S. Cl. 260—5 **8 Claims**

1. Sulfur vulcanizable diene rubber composition the major proportion of the rubber being natural rubber having incorporated therein sulfur and an accelerating amount of a synergistic accelerator combination of thioperoxydiphosphate accelerator of the formula



in which R is alkyl of 1–10 carbon atoms and bis(diamino-s-triazinyl)disulfide accelerator of the formula



in which R_1 and R_3 are hydrogen or the same as R_2 and R_4, R_2 and R_4 independently are alkyl of 1–10 carbon atoms.

3,919,133

VULCANIZABLE COMPOSITIONS AND THE VULCANIZED COMPOSITIONS OBTAINED THEREFROM

Francois Dawans, Bougival, and Jean-Pierre Durand, Chatou, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 27, 1974, Ser. No. 455,077

Claims priority, application France, Apr. 5, 1973, 73.12388

Int. Cl.² C08L *7/00, 9/00;* **C08K** *5/01*

U.S. Cl. 260—5 **17 Claims**

1. A vulcanizable composition which consists essentially of a mixture of (a) vulcanizable elastomer of up to 80% by weight natural rubber, and one or more synthetic polymers having unsaturated hydrocarbon structure, (b) vulcanization ingredients and (c) hydrocarbon oil containing 25-100% by weight of polybutadiene liquid at room temperature having a microstructure comprising 40 - 60% of 1,4 - cis units, 40 - 60% of 1,4 - trans units and less than 5% of 1,2 - units, a glass transition temperature lower than − 90° C, a number average molecular weight lower than 20,000 and prepared by polymerizing 1,3 - butadiene in the presence of at least one π - allyl nickel fluorocarboxylate in an aromatic hydrocarbon, the amount of the polybutadiene liquid being about 3–20 parts by weight per 100 parts by weight of vulcanizable elastomer.

3,919,134

THERMAL INSULATION OF MINERAL FIBER MATRIX BOUND WITH PHENOLIC RESIN

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 10, 1974, Ser. No. 459,530

Int. Cl.² B32B *17/10;* **C08L** *61/14, 89/00*

U.S. Cl. 260—7 **16 Claims**

1. A thermal insulation comprising mineral fibers bonded with a phenolic resin system which comprises:

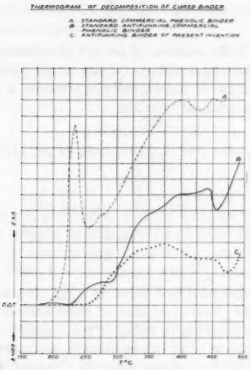
A. a modified resole comprising a phenol-formaldehyde condensate and a dicyandiamide-formaldehyde or a melamineformaldehyde condensate wherein the mole ratio of phenol to dicyandiamide or melamine is in the range of 1:0.2 to 1:1.2, wherein there are between 1.5 and 2.5 moles of formaldehyde per mole of phenol, and, additionally, between 0.9 and 2.0 moles formaldehyde per mole of dicyandiamide or melamine,

B. an etherified methylolaminotriazine wherein the degree of methylolation is at least 1.5; the degree of etherification is at least 0.5 and the etherification agent is an alcohol containing from 1 to 4 carbon atoms, and

C. a proteinaceous compound soluble in aqueous media at a pH of 7 to 10;

wherein the weight ratio of the modified resole to the etheri-

fied methylolaminotriazine is in the range of 10:1 to 1:2 and wherein the weight ratio of the proteinaceous compound to



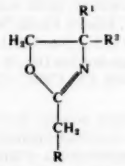
the modified resole and the etherified methylolaminotriazine is in the range of 1:1000 to 1:20.

3,919,135
BINDERS FROM THE CONDENSATIONS OF AN OXAZOLINE WITH AN ETHYLENICALLY UNSATURATED MONOMER AND FORMALDEHYDE

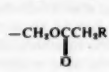
Louis A. Jurisch, Marengo, Ill., assignor to Commerical Solvents Corporation, Terre Haute, Ind.

Filed July 11, 1973, Ser. No. 378,366
Int. Cl.² C08F *26/06, 242/00;* **C08G** *12/26*
U.S. Cl. 260—73 L **14 Claims**

1. A cold-setting, non-polluting resinous binder composition for foundry sand cores comprising the product obtained by (a) reacting an oxazoline corresponding to the formula



wherein R^1 and R^2 are methyl, ethyl, or hydroxymethyl, or an acyloxymethyl group corresponding to the formula



and R is hydrogen or an alkyl or alkenyl fatty acid group of from 1 to 18 carbon atoms or mixture thereof with from 1–50% by weight of monoethylenically unsaturated monomer having a terminal

group

at a temperature of about 300°–400°F in the presence of a peroxide catalyst and a chain transfer agent for a time sufficient to effect said condensation, (b) adding with agitation formaldehyde in an amount of about 3 to about 10% by weight based on the weight of the ethylenically unsaturated monomer and an alkaline catalyst, (c) heating to about 400°F for a period of time sufficient to effect condensation of said formaldehyde and dehydration while (d) separating water and alkanol, if any, and (e) allowing to cool.

3,919,136
ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITION

Robert A. Smith, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 23, 1974, Ser. No. 473,076
Int. Cl.² C08L *1/02*
U.S. Cl. 260—9 **17 Claims**

1. A room temperature vulcanizable silicone rubber composition with thermal stability, low shrinkage upon cure and a long work-life comprising:

a. a linear fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 1000 to 10,000,000 centipoise at 25°C, the organic groups of the aforementioned organopolysiloxane representing monovalent hydrocarbon radicals;

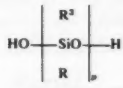
b. 100 and 350% by weight of said linear organopolysiloxane of an extending filler;

c. from 1 to 30% by weight of an alkyl silicate based on said linear organopolysiloxane selected from the class consisting of (1) a monomeric organosilicate corresponding to the general formula,

$$(R'O)_3\,SiR''$$

where R′ is a radical selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and R″ is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, alkoxy and aryloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compound;

d. from 0.5 to 6% by weight based on said linear organopolysiloxane of a work-life extending additive of the formula,



where R^3 is a radical selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, where *p* varies from 2 to 46; and

e. from 0.1 to 5% by weight based on said linear organopolysiloxane of a catalyst which is the reaction product of an organic tin oxide having the formula,

$$R^4\,R^5\,SnO$$

where R^4 and R^5 are monovalent hydrocarbon radicals with a hydrocarbon ester selected from the class consisting of esters of monocarboxylic acid, esters of dicarboxylic acids, and esters of inorganic acids containing at least one oxygen atom in the compound attached to a replaceable hydrogen atom, and where there is reacted from 6 to 1 moles of the organic tin oxide per mole of the ester and the reaction is carried out at a temperature in the range of from room temperature to 250°C.

3,919,137
PROCESS FOR MAKING POLYVINYL CHLORIDE PROCESSING AID INVOLVING COOLING STEP IN ACRYLATE GRAFT POLYMERIZATION OF POLYVINYL CHLORIDE

James N. Dyer, New City, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 21, 1973, Ser. No. 362,159
Int. Cl.² C08F *114/02, 114/16*
U.S. Cl. 260—17 A **25 Claims**

1. In a process for the preparation of a polyacrylate-modified polyvinyl chloride processing aid which comprises: (1) first preparing particles of polyvinyl chloride in the 5–150 micron size range by suspension polymerizing vinyl chloride monomer in the presence of from about 0.01 to 5%, by weight, of the vinyl chloride monomer, of a suspending agent with agitation being applied to the system; (2) removing unreacted vinyl chloride monomer from the system after polymerization of the vinyl chloride is at least 60% complete; (3) adding to the suspension of polyvinyl chloride particles resulting from step (1) an effective concentration of (a) a chain transfer agent, (b) an acrylate ester monomer selected from the group consisting of methyl methacrylate and mixtures of methyl methacrylate together with from about 20 to 0%, by weight, of one or more ethylenically unsaturated comonomers and (c) an effective concentration of at least one free radical initiating catalyst which is soluble in said acrylate ester monomer; said acrylate ester monomer being added to the system in a total amount to provide between about 20– 100% of monomer, by weight of the polyvinyl chloride resulting from step (1); (4) suspension polymerizing the acrylate ester monomer in the presence of the mixture resulting from step (3) while applying agitation; and, (5) recovering the particles of polyacrylate-modified polyvinyl chloride resulting from step (4); said particles of polyacrylate-modified polyvinyl chloride comprising of particles of polyvinyl chloride having polyacrylate ester moieties in and/or on said polyvinyl chloride particles, the improvements which comprise utilizing as said suspending agent in step (1) and alkyl, hydroxyalkyl or carboxyalkyl cellulose, and in step (3) cooling said suspension of polyvinyl chloride particles to a temperature below which substantial polymerization of said acrylate ester monomer can be initiated by said free radical initiating catalyst prior to adding said acrylate ester monomer and said free radical initiating catalyst to said suspension of polyvinyl chloride particle followed by adding said acrylate ester monomer and said catalyst separately to said suspension followed by heating said suspension to a temperature above at least 45°C. to initiate polymerization of said acrylate ester monomer.

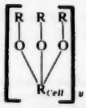
3,919,138
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

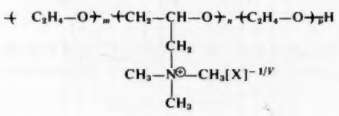
Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,573
Int. Cl.² C08L *1/28*
U.S. Cl. 260—17 R **5 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having and average molecular weight ranging from about 1000 to about 3500 and polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material having the formula:



wherein R_{Cell} is the residue of an anhydroglucose unit, y is an integer having a value of from about 1000 to about 5000, and each R individually represents a substituent group of the general formula:



wherein:

m is an integer having a value of from zero to 10;
n is an integer having a value of from zero to 3;
p is an integer having a value of from zero to 10;
X is an anion; V is an integer which is equal to the valence of X; the average value of *n* per anhydroglucose unit of said cellulose ether is from about 0.01 to about 1; and the average value of m+p per anhydroglucose unit of said cellulose ether is from about 0.01 to about 4; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive, of at least one anionic gum selected from the group consisting of gum karaya, gum arabic, gum Shiraz, gum tragacanth, pectin, pectinates, algin and alginates.

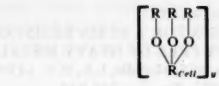
3,919,139
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

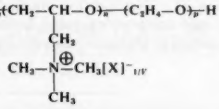
Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,578
Int. Cl.² C08L *1/28*
U.S. Cl. 260—17 R **5 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particles size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5 to about 55 by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material having the formula:



wherein R_{Cell} is the residue of an anydroglucose unit, y is an integer having a value of from about 1000 to about 5000, and each R individually represents a substituent group of the general formula:



wherein:

m is an integer having a value of from zero to 10;

n is an integer having a value of from zero to 3;

p is an integer having a value of from zero to 10;

X is an anion; V is an integer which is equai to the valence of X; the average value of n per anhydroglucose unit of said cellulose ether is from about 0.01 to about 1; and the average value of *m*+*p* per anhydroglucose unit of said cellulose ether is from about 0.01 to about 4; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one anoinic gum selected from the group consisting of carboxymethylcellulose gum and cellulose sulfate gum.

3,919,140

PROCESS FOR PRODUCING ACRYLAMIDE POLYMERS IN AN ACETONE-WATER SOLVENT SYSTEM

Hidekazu Hirata, Toyonaka, and Siro Sakai, Higashiosaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 285,117, Aug. 31, 1972, abandoned. This application Dec. 27, 1974, Ser. No. 536,865

Int. Cl.² C08L *1/10*; **C08F** *120/52*; **C08L** *51/00*

U.S. Cl. 260—17 A **19 Claims**

1. A process for producing acrylamide polymers which comprises conducting the polymerization of acrylamide or methacrylamide or polymerizable monovinylic monomers containing predominantly acrylamide or methacrylamide in a mixture of acetone and water in the presence of polyvinyl alcohol, the amount of acetone being from 23 to 29.5% by weight based on the weight of the acetone-water mixture and the amount of polyvinyl alcohol being from 0.5 to 4% by weight based on the weight of the polymerizable monomers.

3,919,141

ASBESTOS SUBSTITUTE

Eugene J. Quattrociocchi, Scotia, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed July 12, 1974, Ser. No. 488,203

Int. Cl.² C08L *1/02*

U.S. Cl. 260—17.2 **6 Claims**

1. A phenol-aldehyde molding composition containing as a filler 100 percent cotton rag pulp, said pulp having been prepared by a process consisting essentially of (1) aqueous alkaline digestion of cotton rags to form a pulp followed by (2) mechanical shearing in aqueous medium to cause hydration and fibrillation of the pulp, and (3) subsequent drying of the pulp.

3,919,142

LIQUID POLYAMIDE EPOXY RESIN HARDENER

Schumkichiro Asai, and Yasuyuki Kawakatsu, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,081

Claims priority, application Japan, Dec. 27, 1972, 47-1517

Int. Cl.² C08G *59/44*

U.S. Cl. 260—18 PN **9 Claims**

1. A liquid polyamide resin, useful as an epoxy resin hardener, consisting essentially of the reaction product of a carboxylic acid or ester reactant and a polyamine reactant, reacted at a ratio of carboxyl equivalents to amine equivalents of from 1:1.2 to 1:5.0, at 110° to 350°C, for from 1 to 10 hours, said reaction product having a molecular weight of from 400 to 2000,

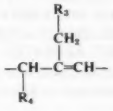
said carboxylic acid or ester reactant consisting essentially of

A. a dibasic component consisting of

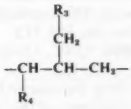
1. up to 50 mole % of dimer acid having 32 to 44 carbon atoms, and
2. the balance is a compound or mixture of compounds having the formula

$$R_2OOC—CH_2—CH_2—R_1—CH_2—CH_2—COOR_2$$

wherein R_1 has the formula



or



wherein R_3 and R_4, which can be the same or different, are hydrogen or alkyl having 1 to 19 carbon atoms and R_2 is hydrogen or a radical which forms an ester with acrylic acid,

B. from zero to less than 2 equivalents, per one equivalent of the dibasic component A, of a monobasic acid capable of controlling the molecular weight of the polyamide product;

said polyamine reactant consisting essentially of

3. up to 50% by weight of a polyamine selected from the group consisting of aromatic polyamines and alicyclic polyamines, and
4. the balance is polyalkylene polyamine having the formula $H_2N(CH_2CH_2NH)_nH$, wherein *n* is an integer of from 1 to 5.

3,919,143

VULCANIZABLE COMPOSITIONS CONTAINING HALOGEN-BEARING ELASTOMERIC POLYMERS

Roger E. Morris, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 4, 1974, Ser. No. 439,258

Int. Cl.² C08F *8/46*, *20/22*, *114/14*, *114/16*

U.S. Cl. 260—18 R **41 Claims**

1. A vulcaniza composition comprising (1) a halogen-bearing elastomeric polymer, and (2) a cure system consisting essentially of (a) a di- or polyfunctional carboxylic acid having 6 to about 40 carbon atoms in the molecule, (b) quaternary ammonium salt or a monofunctional secondary or tertiary amine, and (c) a halide ion acceptor selected from the group consisting of (I) alkali and non-alkali metal salts of monocarboxylic acids containing 2 to about 24 carbon atoms, (II) metal salts of organo-phosphoric acids of the structure

$$(RO)_yPO_zOM$$

wherein M is an alkali metal, $y = 1$ or 2, $z = 1$ or 2, and $y + z = 3$, and R is an alkyl radical containing 1 to 24 carbon

atoms, an aryl radical containing 6 to 24 carbon atoms, or an alkyl phenoxy poly(ethyleneoxy)ethyl group, (III) a non-alkali metal oxy compound selected from the group consisting of oxides, hydroxides, and carbonates of barium, lead, calcium, magnesium, zinc, copper, aluminum, or cadmium, (IV) an alkali or alkaline earth metal hydroxides, alkoxide, carbonate, borate, silicate, or phosphate, and (V) untreated molecular sieves; (a) used at from about 0.1 part to about 10 parts by weight, (b) used at from about 0.1 part to about 10 parts by weight, and (c) used at from about 0.1 part to about 15 parts by weight, all based on 100 parts by weight of the halogen-bearing elastomer.

3,919,144

PRODUCTION OF POLYESTERS FROM TRIS(β-HYDROXYALKYL)ISOCYANURATE ALKYLENE OXIDE ADDUCTS

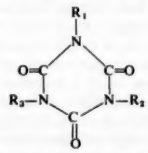
Robert L. Formaini, Millington, and Edwin D. Little, Convent Station, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 101,130, Dec. 23, 1970, Pat. No. 3,859,284, which is a continuation-in-part of Ser. No. 738,851, June 21, 1968, abandoned. This application Sept. 27, 1974, Ser. No. 509,773

Int. Cl.² C08G *73/06, 18/46, 63/68*

U.S. Cl. 260—20 **13 Claims**

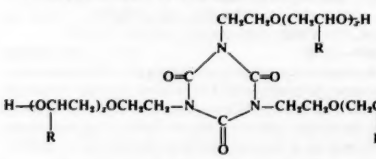
1. A polyester comprising the reaction product of a dicarboxylic acid and an isocyanurate of the formula



wherein R_1 is a hydrogen-terminated oxyalkylene chain of from 2 to 30 oxyalkylene units, and R_2 and R_3 are each of hydrogenterminated oxyalkylene chain of from 1 to 30 oxyalkylene units, wherein each oxyalkylene unit has the formula

wherein R at each occurrence independently is hydrogen, methyl or ethyl.

10. An oil modified polyester according to claim **9** wherein said isocyanurate has the formula



wherein R is according to claim **20**, *x* is an integer from 1 to 29 and *y* and *z* are integers from 0 to 29.

12. An oil modified polyester according to claim **9** additionally containing 10 to 80% by weight of an oil soluble phenol-formaldehyde resin, based on the total weight of the oil modified polyester and phenol-formaldehyde resin.

3,919,145

CHEMISTRY AND PROCESS FOR A STAIN RESISTANT AQUEOUS HOUSE PAINT FREE OF HEAVY METALS

Paul S. Eckhoff, P.O. Box No. 805, Melville, L.I., N.Y. 11746

Filed July 23, 1973, Ser. No. 382,040

Int. Cl.² C09D *3/72, 5/02*

U.S. Cl. 260—22 TN **15 Claims**

1. A composition for the painting or repainting of staining woods, said composition containing an aqueous resin binder formed by blending (1) an aqueous alkaline emulsion of a polyurethane resin based on a drying oil and (2) an aqueous dispersion of a film-forming interpolymer useful as a paint vehicle, said composition being further characterized by the incorporation of aluminum chlorhydrate into said mixed resin binder.

3,919,146

CAULKING COMPOSITION COMPRISING POLYMER HAVING ADDITION POLYMERIZED BACKBONE HAVING CARBOXYL GROUPS ESTERIFIED WITH DRYING OIL FATTY ACID GLYCIDYL ESTER

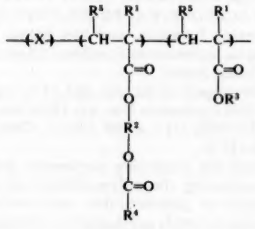
William D. Emmons, Huntingdon Valley, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

Division of Ser. No. 178,429, Sept. 7, 1971, Pat. No. 3,786,020. This application July 27, 1973, Ser. No. 383,230. The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.² C08G *81/02*

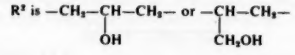
U.S. Cl. 260—23 EP **5 Claims**

1. An addition polymer having a backbone of copolymerized ethylenically unsaturated monomers with a Tg below 10°C., one of which is an unsaturated carboxylic acid monomer, the backbone being modified by having pendant ester groups, the modified polymer having units of the following structure:



wherein

R^1 is H, lower alkyl, halogen, $-CH_2COOR$, $-COOR$, or $-CH_2COOH$, R being lower alkyl of from 1 to 8 carbon atoms;

R^2 is 

R^3 being at least one of H, or at least one lower alkyl radical having from 1 to 8 carbon atoms, at least a portion of R^3 being H, to give free carboxyl groups;

R^4 is an unsaturated, air curable alkyl radical;

R^5 is H, $-COOH$, or $-CONH_2$ or $-COOR$, wherein R is as above;

X is derived from at least one other vinyl monomer and is optional;

the units in parentheses being in any order, which polymer is derived from the esterification of some of the carboxylic groups in said backbone by at least one unsaturated fatty acid glycidyl ester, the amount of said unsaturated carboxylic acid in the backbone, before modification, being from 0.25 to 25 weight percent on the basis of copolymerized monomers, and the molar ratio of free carboxyl groups to glycidyl ester

groups, before modification of the backbone, being from about 1:0.9 to 1:0.2.

3,919,147
ABIETATE MODIFIED POLYSULFIDE POLYMERS AND OTHER RESINS AS ADHESIVE ADDITIVES FOR LIQUID POLYSULFIDE POLYMER BASED ADHESIVE COMPOSITIONS

Jose L. Villa, Heightstown, N.J., assignor to Thiokol Corporation, Bristol, Pa.

Division of Ser. No. 252,646, May 12, 1972, Pat. No. 3,813,368. This application July 6, 1973, Ser. No. 377,162
Int. Cl. C08g *17/16*
U.S. Cl. 260—26 **2 Claims**

1. A curable, liquid, abietate-modified polysulfide polymer based sealant composition containing as an adhesive additive, about 0.5 to 5.0 parts by weight per 100 parts by weight of polysulfide polymer prepared by reacting a liquid polyester polymer having a molecular weight of from 500 to 4,000 and abietic acid in a solvent at a temperature of 130°C. to 200°C. under an inert atmosphere.

3,919,148
PAVEMENT COMPOSITION

Robert E. Winters, 1533 Fishburn Ave., Los Angeles, Calif. 90063, and Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Division of Ser. No. 381,272, July 20, 1973, Pat. No. 3,844,668, which is a continuation of Ser. No. 217,516, Jan. 13, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,348
Int. Cl.² C08L *95/00*
U.S. Cl. 260—28.5 AS **17 Claims**

1. An elastomeric material comprised of a reaction product of paving asphalt, non-oil resistant, asphalt-soluble rubber, and an asphalt solvent; the material being prepared by heating the asphalt to a first temperature of from about 300° to about 500°F. to yield hot liquid asphalt having a viscosity of less than 200 centipoises; reacting between about 2 and about 4 parts by weight of the hot asphalt with one part of the rubber, granulated to a mesh size between − 4 and + 50, to form a jellied asphalt-rubber composition having a viscosity of from about 2000 to about 200,000 centipoises; allowing the jellied-asphalt-rubber composition to cool to a second temperature from about 200° to about 340°F.; mixing the cooled jellied-asphalt-rubber composition with from about 5 to about 20%, by volume of said composition, of the asphalt solvent, said solvet having a boiling point above said second temperature to form the elastomeric material having a viscosity of from about 1000 to about 10,000 centipoises.

3,919,149
WAX EMULSIONS

Donald R. Cushman, Wenonah, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1974, Ser. No. 464,717
Int. Cl.² C08L *91/00*
U.S. Cl. 260—28.5 AV **8 Claims**

1. An aqueous wax emulsion containing from about 30% to about 60%, by weight, paraffin wax; from about 0.2% to 10% of a copolymer of ethylene and acrylic acid having a hardness (ASTM D-5) from about 1 to about 5, a viscosity - cps. (Brookfield) from about 350 to about 800, and an acid No. from about 30 to about 90; a minor amount of an emulsifier; and water in an amount sufficient to form the emulsion.

3,919,150
HYDROXY FUNCTIONAL ACRYLIC INK

Robert H. Kiel, deceased, late of Weston, Ohio, by Jessie H. Kiel, administratrix, Weston, and William C. Grinonneau, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 92,946, Nov. 25, 1970, Pat. No. 3,729,339, which is a continuation of Ser. No. 693,050, Dec. 13, 1967, abandoned. This application Mar. 20, 1973, Ser. No. 343,084
Int. Cl.² C08L *61/20*
U.S. Cl. 260—28.5 R **4 Claims**

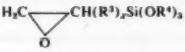
1. As a composition of matter, a thermosetting, organic resin based glass decorating composition exhibiting increased brightness, opaqueness, hardness and gloss, and capable of being cured at high elevated temperatures up to 2000°F. without browning or degrading thereof, said composition consisting essentially of an acrylic resin containing reactive hydroxyl groups which is a copolymer of a hydroxyl bearing monomer having the formula:

$$R'CH = \overset{R^2}{C}COO(CH_2)_nOH,$$

where R′ and R² are the same or different members selected from hydrogen and alkyl radicals of less than eight carbons and *n* is an integer of 1 to 10, which is copolymerizable by addition polymerization with at least one polymerizable ethylenically unsaturated monomer selected from vinyl aromatic compounds free of substituents capable of reacting with a hydroxyl group and esters of saturated alcohols and unsaturated acids containing one to 20 carbon atoms,

a thermosetting aminoplast resin containing reactive hydrogen atoms, and

an ambifunctional, epoxy reactive silane having the structural formula:



wherein R³ is selected from divalent hydrocarbon radicals of less than 10 carbon atoms and divalent hydrocarbon radicals of less than 10 carbon atoms containing at least one oxygen atom being in the form of an ether linkage, and wherein *x* has a value of either 0 or 1, and R⁴ is selected from the same or different members of the group consisting of hydrogen and aliphatic hydrocarbon radicals of less than five carbon atoms, the epoxy reactive silane being present in an amount sufficient to substantially improve the permanency of adhesion of the composition to the glass when subjected to a 3 percent by weight caustic solution at 160°F. for at least 20 minutes, and the proportion of the acrylic resin being 80 to 120 percent of the stoichiometric molar ratio of the acrylic resin to the aminoplast resin, said stoichiometric molar ration being determined by the reaction of all of the reactive hydroxyl groups of the acrylic resin with all of the reactive hydrogen atoms of the aminoplast resin.

3,919,151
PREPARATION OF LOW FREE RESORCINOL CONTAINING RESORCINOL-PHENOL COPOLYMER RESINS

Roy H. Moult, Murrysville, and John J. Colligan, Valencia, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 309,501, Nov. 24, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,057
Int. Cl.² C08L *61/12*
U.S. Cl. 260—29.3 **1 Claim**

1. A phenol-formaldehyde-resorcinol resin prepared
1. by reacting a mixture of 60–70 moles of phenol and 60–70 moles of formaldehyde at a temperature of between about 60°C. and the boiling point of the phenol-

formaldehyde reaction mixture under the mildly alkaline conditions of an initial pH of 8 to 10 that are provided by aqueous caustic until said mixture has a dilutability of 1:1.2 to 1:0.8 at the pH of said reaction mixture;

2. adding 30–40 moles of resorcinol to said reaction mixture at the foregoing temperature whereby said resorcinol reacts to form a phenol-formaldehyde-resorcinol resin;
3. distilling the mixture to remove as distillate substantially all the volatiles such as water and unreacted phenol;
4. adding to the residue a volume of water that is about twice the volume of said residue whereby there is formed an oily phase and an aqueous phase, the unreacted resorcinol being substantially in the aqueous phase;
5. adding sufficient formaldehyde to said aqueous phase to react with unreacted resorcinol in said phase; and thereafter
6. raising the pH value of the reaction mixture to a pH of at least 9 whereby the mixture becomes a uniform solution, the resin in said solution having a solubility such that the said solution can have a solids content of 39–40% and said resin being self-curing at elevated temperatures.

3,919,152
USE OF BARIUM METABORATE IN ELECTRODEPOSITABLE COMPOSITIONS

Myron J. Krupp, Grafton; Fred R. Colburn, Franklin, and John P. Knudtson, Milwaukee, all of Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 751,003, Aug. 8, 1968, Pat. No. 3,645,871. This application May 28, 1971, Ser. No. 148,220
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 UA **6 Claims**

1. In an electrodepositable water-dispersed coating composition comprising:

a. an at least partially-neutralized interpolymer of from about one percent to about 20 percent by weight of a hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid, from about one to about 20 percent by weight of an unsaturated carboxylic acid and at least one other copolymerizable ethylenically unsaturated monomer and

b. a pigment; the improvement wherein an amount of barium metaborate effective to remove stain from iron is present

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3,919,153
ADHESIVE COMPOSITIONS

Adolf A. Fischer, Fall River, Mass., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 182,272, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 831,258, June 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 540,526, April 6, 1966, abandoned. This application Oct. 1, 1973, Ser. No. 401,975
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 UA **4 Claims**

1. An adhesive composition in a water-in-oil emulsion form, comprising as the exterior continuous phase, a solution of about 20–80 weight percent of a chlorinated polyolefin selected from a group consisting of chlorosulfonated polyethylene having from 25 to 43 percent chlorine and 1.0 to 1.4 percent sulfur and polypropylene chloride having at least 65 percent chlorine in an organic solvent; an interior dispersed phase comprising an aqueous dispersion of about 15 to 75 weight percent of a resinous acrylic ester formed by polymerization of a monomer which may be described by the following general formula:

$$R_1-CH=\underset{\displaystyle R}{\overset{\displaystyle O}{\overset{\|}{C}}}-\overset{\displaystyle O}{\overset{\|}{C}}-O-R_2$$

wherein R and R_1 are hydrogen, methyl or alkyl groups of 1 to about 10 carbon atoms, and R_2 is an alkyl group of 1 to about 10 carbon atoms, and mixtures thereof, about 0.05 to 3.5 weight percent of a water-in-oil emulsifying agent and about 0.01 to 3.0 weight percent of an acidic water-soluble curing agent.

3,919,154
AQUEOUS COATING COMPOSITION OF ACRYLIC POLYMER LATEX, ACRYLIC POLYMER SOLUTION AND AMINOPLAST AND METHOD OF MAKING

Yun-Feng Chang, Plymouth; Mo-Fung Cheung, Warren, and Santokh S. Labana, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 3, 1974, Ser. No. 476,114
Int. Cl.² C08L *29/02, 33/02, 61/24, 61/28*
U.S. Cl. 260—29.4 UA **13 Claims**

1. In an aqueous dispersion of paint in which a carboxy-functional polymer is at least partially neutralized with a water-soluble amine and dispersed with an amino resin crosslinking agent selected from melamine-formaldehyde resins and urea-formaldehyde resins in an aqueous solution of water and a water-soluble amine, the improvement wherein the film-forming components of said dispersion of paint exclusive of said amino resin comprises the combination of:

I. about 5 to about 50 parts by weight of a solution polymer which is a carboxy-functional copolymer of acrylic monomers that:
   A. is at least partially neutralized with said water-soluble amine.
   B. is soluble in said aqueous solution,
   C. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
   D. has Tg in the range of −15°C. to 50°C., and

II. about 50 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy functionality and hydroxy functionality and is a copolymer of acrylic monomers that:
   A. is essentially insoluble in said aqueous solution,
   B. has average molecular weight (M_n) in the range of about 3,000 to about 20, 000, and
   C. has Tg in the range of −15°C. to 50°C.,

and wherein said amino resin crosslinking agent is present in an amount in the range of about 15 to about 35 weight percent of the sum of the weights of said solution polymer and said emulsion polymer.

3,919,155
SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Edward Noonan Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 99,637, Dec. 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 22,715, March 25, 1970, abandoned. This application Dec. 19, 1973, Ser. No. 429,025
Int. Cl.² C07C *85/18*
U.S. Cl. 260—571 **14 Claims**

1. An improved process for aminating an aromatic compound selected from diphenyl ether, its monoamino derivatives, benzene, aniline and pyridine, which comprises reacting ammonia with said aromatic compound in the presence of from one mole percent to 250 mole percent of water based on the molar amount of the aromatic compound at a temperature of from 150°C. to 500°C. and at a pressure of from 10 to 1,000 atmospheres while the ammonia and the aromatic compound are in intimate molecular contact with a metallic nickel/nickel oxide cataloreactant containing a mole ratio of metallic nickel

to nickel oxide of 0.001:1 to 10:1, the aromatic compound being miscible with ammonia at the temperature and pressure of the amination reaction.

3,919,156

ANIONIC EMULSION POLYMERIZATIONS OF VINYL AND ACRYLIC MONOMERS

Ravi Khanna, and Frederick J. Jacoby, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 278,301, Aug. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 180,116, Sept. 13, 1971, abandoned. This application May 21, 1974, Ser. No. 472,020

Int. Cl.² C08F *2/26*

U.S. Cl. 260—29.6 TA **8 Claims**

1. In an emulsion polymerization process for preparing a latex of at least ternary copolymers, which process comprises emulsifying the monomer of a water soluble unsaturated carboxylic acid, at least one nitrile or ester of an unsaturated carboxylic acid, and an unsaturated polymerizable compound free from acid or nitrile groups, the improvement comprising the steps of first contacting said water soluble acid in an aqueous medium with an anionic dispersing agent, agitating said mixture for at least 30 minutes to provide stabilization between said carboxylic acid group containing monomer and the dispersing agent, after which the remaining monomers forming said copolymers are added and emulsion polymerization effected.

3,919,157

THERMOPLASTIC RESIN COMPOSITION HAVING HIGH TRANSPARENCY AND HIGH IMPACT STRENGTH

Fumio Ide; Kazuo Kishida, both of Ohtake; Toshio Sakurai, Hiroshima, and Syoichi Kawakami, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Nitto Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 344,501, March 26, 1973, abandoned, which is a continuation of Ser. No. 59,351, July 29, 1970, abandoned. This application Feb. 12, 1974, Ser. No. 441,891

Claims priority, application Japan, Aug. 6, 1969, 44-62116; Oct. 31, 1969, 44-87313

Int. Cl. C08c *11/66;* **C08d** *7/00;* **C08f** *19/18*

U.S. Cl. 260—29.7 T **8 Claims**

1. A thermoplastic resin composition having a high transparency substantially unaffected by molding conditions and a high impact strength which comprises (I) 97 to 99.99 percent by weight of a resin composed of (A) 10 parts by weight of a butadiene rubber selected from the group consisting of polybutadiene and styrenebutadiene rubbers containing at least 60 percent by weight of butadiene which butadiene rubber has a weight average particle diameter of 0.20 to 0.35 μ, a particle diameter distribution in the range of 0.05 to 1.5 μ and a degree of swelling of at least 10, and (B) 15 to 190 parts by weight of a terpolymer of a monomer mixture comprising 30 to 65 percent by weight of styrene, 15 to 65 percent by weight of methyl methacrylate and 2 to 20 percent by weight of acrylonitrile, at least a portion of (I) being a graft-copolymer of (A) and (B) obtained by polymerizing at least 5 parts by weight of said monomer mixture in the presence of said (A) component over a period of 30 minutes to 10 hours in the presence of a radical polymerization initiator, said polymerization being effected while continuously or intermittently adding said monomer mixture to a latex of said (A) component; and (II) 0.01 to 3 percent by weight of an oily polyorganosiloxane.

3,919,158

POLYVINYL CHLORIDE PLASTICIZED WITH MIXED PHOSPHATE ESTERS

Donald Richard Randell, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy AG, Switzerland

Continuation-in-part of Ser. No. 74,909, Sept. 23, 1970, abandoned, which is a division of Ser. No. 645,888, June 14, 1967, Pat. No. 3,567,923. This application June 15, 1973, Ser. No. 370,455

Claims priority, application United Kingdom, June 18, 1966, 27316/66

Int. Cl.² C08K *5/52*

U.S. Cl. 260—30.6 R **7 Claims**

1. A composition consisting essentially of polyvinyl chloride and as plasticizer therefor a plasticizing amount of a phosphate ester composition consisting essentially of a phosphorylated C_3— or C_4 alkylated phenol/phenol ester mixture wherein the weight ratio of the alkyl moiety to phenol moiety ranges from 0.05 to about 0.65, which ester is prepared by steps comprising:

a. alkylating at a temperature of from about 15° to 250°C. in the presence of a Lewis acid or a Bronsted acid as catalyst, phenol with propylene or butene to obtain an isopropylated or sec-butylated phenol reaction mixture, and

b. reacting said alkylated phenol reaction mixture with a phosphorylating agent.

3,919,159

THERMOPLASTIC VINYL TILE PRODUCTS AND PRODUCTION THEREOF

Robert A. Burns, Long Valley, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 424,337, Dec. 10, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 512,099

Int. Cl.² C08K *3/26, 3/34, 7/00*

U.S. Cl. 260—31.2 R **10 Claims**

1. A reinforced thermoplastic vinyl chloride tile composition suitable for the manufacture of floor tile which comprises a minor weight proportion of a plasticized vinyl chloride polymer uniformly mixed with a major weight proportion of a mixture of finely divided mineral fillers, said mixture of fillers comprising, based on the total weight of said composition, 2% to 15% attapulgite clay which has been heat activated to a volatile matter content below 10% by weight, 15 to 35% platy talc and 30 to 50% calcium carbonate, with the proviso that the combined amount of mineral fillers is in the range of about 55 to 85% of said total weight, said composition being free from asbestos.

3,919,160

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,467

Int. Cl.² C08K *5/07*

U.S. Cl. 260—32.8 A **7 Claims**

1. An adhesive composition consisting essentially of a styrene-butadiene block copolymer, a styrene-isoprene block copolymer, an isoprene-piperylene copolymer and a solvent wherein the components are present in the following ranges, assuming the presence of 100 parts by weight of the styrene-butadiene component in the final composition:

Component	Weight Per Cent
Styrene-Isoprene Block Copolymer	5–300
Isoprene-Piperylene Copolymer	5–300
Solvent	50–4,000

wherein said styrene-butadiene block copolymer has the following general configuration:

$$A - B - A,$$

wherein A is a styrene polymer block having an average molecular weight of about 5,000 to about 125,000 and B is a butadiene polymer block having an average molecular weight of about 15,000 to about 250,000, with the total of said terminal blocks A amounting to about 20 to about 80 weight per cent of the block copolymer, wherein the styrene-isoprene block copolymer has the following general configuration:

$$A_1 - B_1 - A_1,$$

wherein A_1 is a styrene polymer block having an average molecular weight of about 2,000 to about 100,000 and B_1 is an isoprene polymer block having an average molecular weight of about 25,000 to about 1,000,000, with the total of said terminal blocks A_1 amounting to about eight to about 50 weight per cent of the block copolymer, the melting points of the isoprene-piperylene copolymer being in the range of about 70° to about 130°C., and said solvent being selected from the group consisting of aromatics having from six to eight carbon atoms, aliphatics having from six to eight carbon atoms, ketones having from two to four carbon atoms and esters having from two to four carbon atoms.

3,919,161
HEAT CURABLE POLYSILOXANE COMPOSITIONS CONTAINING FIBERS

Frank J. Glaister, Ballston Spa; Verne G. Simpson, Scotia, and George P. De Zuba, Waterford, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 213,727, Dec. 29, 1971, Pat. No. 3,814,722. This application Oct. 9, 1973, Ser. No. 404,379The portion of the term of this patent subsequent to June 4, 1991, has been disclaimed.

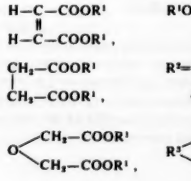
Int. Cl.² C08L *83/00*

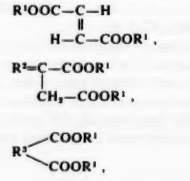
U.S. Cl. 260—37 SB **14 Claims**

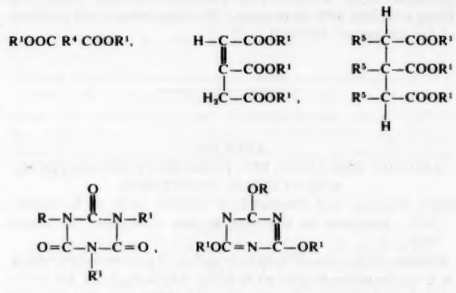
1. A process for forming a cured silicone rubber consisting essentially of mixing 15 to 94.75% by weight of the mixture of an organopolysiloxane polymer having a concentration of 0.1 to 0.6% by weight of alkenyl radicals and having a viscosity of at least 100,000 centipoise at 25°C of the formula,

$$R_nSiO_{4-n/2}$$

with 5 to 75% by weight of the mixture of an asbestos fiber, 0.1 to 8% by weight of the organopolysiloxane of a peroxide curing catalyst and 0.25 to 10% by weight of the mixture of an organic additive compound selected from the group consisting of,







and mixtures thereof, where R and R^2 are radicals selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, R^1 is selected from unsaturated monovalent hydrocarbon radicals and unsaturated halogenated monovalent hydrocarbon radicals, R^3 is a divalent hydrocarbon radical of up to 20 carbon atoms, R^4 is an arylene radical, R^5 is selected from the same radicals as R and hydrogen, a varies from 1.95 to 2.01, and heating the resulting mixture to a temperature in the range of 80°C to 650°C.

3,919,162
CATALYST SUPPLY AND RECLAMATION IN COLD BOX CORE MAKING PROCESSES

William E. Austin, Bay Village, Ohio, assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 15, 1974, Ser. No. 451,645

Int. Cl.² B22C *9/14*; C08L *61/10*

U.S. Cl. 260—38 **20 Claims**

1. A cold box coremaking process wherein a core material-resin binder mixture is cured in a core box assembly having separate inlet and exhaust manifolds comprising the steps of: supplying a liquid catalyst/gas carrier mixture, with said liquid catalyst comprising at least 10 percent by weight of said mixture, to said inlet manifold at a predetermined positive pressure thereby curing said core material-resin binder mixture in a single gassing period, applying a vacuum pressure to said exhaust manifold to extract surplus liquid catalyst/gas carrier mixture from said assembly while supplying said liquid catalyst/gas carrier mixture to said inlet manifold; compressing said extracted mixture to substantially said predetermined positive pressure; and subsequently returning said compressed liquid catalyst/gas carrier mixture to said inlet manifold at said predetermined pressure to enable curing of further core material-resin binder mixtures.

3,919,163
BIODEGRADABLE CONTAINERS

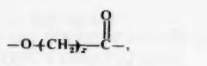
Robert A. Clendinning, New Providence; James E. Potts, Millington, and Walter D. Niegisch, Watchung, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 275,972, July 28, 1972, Pat. No. 3,852,913. This application July 15, 1974, Ser. No. 488,499

Int. Cl.² A01C *1/02*; C08G *63/02*

U.S. Cl. 260—40 R **15 Claims**

1. An article of manufacture which comprises: a. a biodegradable container fabricated from material containing (i) from about 10 to less than 100 weight percent of biodegradable thermoplastic oxyalkanoyl polymer, said polymer having a reduced viscosity value of at least about 0.1 and upwards to about 12 and being further characterized in that at least about 10 weight percent of said thermoplastic oxyalkanoyl polymer is attributable to recurring oxyalkanoyl units of the formula



wherein x is an integer having a value of 2 to 7, with the proviso that x does not equal 3; (ii) from more than 0 to about 90 weight percent of a plastic additive, and (iii) from 0 to about 90 weight percent of a filler, based on the weight of said container; and b. a medium to germinate and grow seeds or seedlings in said container.

3,919,164
PROCESS FOR EXTRUDING THERMOPLASTIC RESIN COMPOSITION CONTAINING A HIGH INORGANIC FILLER CONTENT

Takeo Hattori; Yoshio Hoya, and Atsushi Maeda, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1973, Ser. No. 342,435

Claims priority, application Japan, Mar. 23, 1972, 47-29289

Int. Cl.² C08K *3/00, 5/00;* **B28B** *3/20*

U.S. Cl. 260—42 **7 Claims**

1. A process for extruding a thermoplastic resin composition containing 30–90% by weight of an inorganic filler which comprises:

mixing from 5–50 parts by weight of large particles of a thermoplastic resin having an average particle diameter greater than 1,000 μ with 100 parts by weight of a fine powder mixture of a thermoplastic resins having an average particle diameter of 0.1 – 100 μ and which is 20–32 mesh and an inorganic filler; and

extruding said mixture.

3,919,165
STABILIZED POLYVINYL CHLORIDE COMPOSITIONS

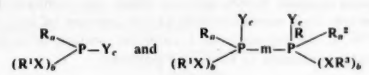
Ingenuin Hechenbleickner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 444,236, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 345,699, March 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,509, Oct. 4, 1971, abandoned. This application Aug. 14, 1974, Ser. No. 497,406

Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.75 K **12 Claims**

1. A composition of matter suitable for stabilizing vinyl chloride polymers comprising (1) 0.125 –3 parts an organotin compound selected from the class consisting of R_2SnO, R Sn OOH, polymers of said tin oxides, R Sn $(OR')_3$ and $R_2Sn(OR')_2$ where R and R′ are hydrocarbon groups having 1–18 carbon atoms or two R groups may consist of one alkylene group having 2–4 carbon atoms, and (2) 0.125 –3 parts a thiophosphorus compound selected from the class consisting of



where

R, R^1, R^2 and R^3 are hydrocarbon groups having 1–18 carbon atoms, $(CH_2)_pCOOR^4$, or hydrogen, with each phosphorus atom attached to no more than one hydrogen, R^4 is a hydrocarbon group having 1–12 carbon atoms, and n is 1 or 2;

X and Y are oxygen or sulfur with at least one of them being sulfur;

a and b are 0 to 3, and c is 0 to 1, the sum of a, b and c being consistent with a valence of 3 or 5 for phosphorus;

m is sulfur, X — $(CH_2)_pX$, or S $(CH_2)_pCOOR^5OCO$ — $(CH_2)_pS$, p is 1–10, and R^5 is a divalent hydrocarbon radical having 1–10 carbon atoms.

3,919,166
FIRE RETARDANT POLYURETHANES AND POLYUREA-URETHANES HAVING IMPROVED PROCESSABILITY AND COLOR STABILITY

Armand Edward Brachman, Allentown, Pa., assignor to GAF Corporation, New York, N.Y.

Filed May 31, 1972, Ser. No. 258,164

Int. Cl.² C08G *18/38;* **C08K** *5/15*

U.S. Cl. 260—45.8 A **21 Claims**

1. A fire retardant polyurethane or polyurea composition having improved processability and color stability comprising the reaction product of:

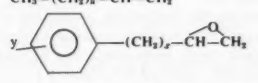
A. an organic compound component containing a plurality of active hydrogen-containing groups reactive with -NCO groups;

B. an organic polyisocyanate component; and

C. 2,3-dibromo-2-butenediol-1,4, said reaction product having:

i. a bromine content of from about 4 to about 22 percent by weight;

ii. an NCO/OH ratio of about 0.95 – 1.15:1; and having incorporated therein as stabilizer 0.5 to 7 percent by weight of the components of an epoxide selected from the group consisting of compounds having the formula



and

wherein y = H, $C_{1\text{-}12}$ alkyl, $C_{1\text{-}4}$ alkoxy or halogen, $x = 0$ to 4 and $n = 0$ to 25.

3,919,167
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,166

Int. Cl.² C08L *69/00*

U.S. Cl. 260—45.8 N **8 Claims**

1. A flame retardant aromatic polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of heterocyclic compounds, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of the metal salts, and wherein said substituent on the metal salt of the substituted sulfonic acids of heterocyclic compounds is selected from the group consisting of an electron withdrawing radical and mixtures of electron withdrawing radicals; and wherein said heterocyclic compound is selected from the group consisting of five and six membered heterocyclic nuclei containing a hetero atom selected from the group consisting of nitrogen, oxygen and sulfur.

3,919,168
VINYL HALIDE RESIN STABILIZER COMPOSITIONS OF ORGANOTIN OR ANTIMONY ORGANIC SULFUR-CONTAINING COMPOUNDS AND TRI-ALKALI METAL PHOSPHATES

Dale J. Dieckmann, Euclid, Ohio, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 19, 1974, Ser. No. 462,360

Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.75 S **23 Claims**

7. A vinyl halide resin composition which comprises a vinyl halide resin and, as a heat stabilizer, an effective amount of a composition consisting essentially of,

a tri-alkali metal phosphate, and

a compound selected from the group consisting of an organotin sulfur-containing compound having a

group and an antimony organic sulfur-containing compound having a Sb-S group, and mixtures thereof, said compound and metal phosphate components in relative amounts which together provide a synergistic heat stabilizing effectiveness upon said resin.

3,919,169

CONTINUOUS PROCESS FOR THE PRODUCTION OF SOLID EPOXY RESINS

David W. Ramsey, Houston, and Charles H. Jayroe, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1974, Ser. No. 444,087

Int. Cl.² C08G *30/04*

U.S. Cl. 260—47 EP **3 Claims**

1. A process for the continuous production of solid epoxy resins which comprises passing a reaction mixture comprising a liquid aromatic epoxy resin containing 62-epoxy groups, a dihydric phenol and a catalyst for effecting a reaction between said liquid epoxy resin and dihydric phenol through

first, a preheat zone wherein the reaction mixture is heated to a temperature below the reaction temperature of said mixture;

second, a reaction zone wherein the reaction mixture is maintained at a temperature between about 130° to about 250°C; and

third, a post-heat zone wherein the temperature is maintained at a temperature between about 130° to about 250°C,

while maintaining a positive backpressure in each of said first, second and third zones; and subsequently recovering the resultant solid epoxy resin.

3,919,170

ARYLENE-BIS(PHENYLENE-PHOSPHINIC ACID)-4,4′-DI-CARBOXAMIDE POLYMERS

Pierre Allard, Cailloux-sur-Fontaines, France, assignor to Rhone-Poulenc-Textile, Paris, France

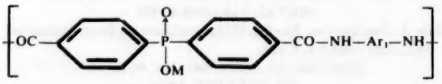
Filed July 22, 1974, Ser. No. 490,751

Claims priority, application France, July 24, 1973, 73.27316; July 24, 1973, 73.27317

Int. Cl.² C08G *73/14*

U.S. Cl. 260—47 CB **15 Claims**

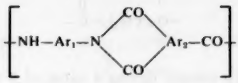
1. Aromatic polymers having an inherent viscosity of greater than 0.5 and consisting essentially of units of a metal salt of an arylene-bis-(phenylene-phosphinic acid)-4,4′-dicarboxamide of the formula:



with units of at least one of the two types:

diamide units of the formula —NH—Ar_1—NH—CO—Ar—CO— and

amide-imide units of the formula:



in which Ar represents a divalent aromatic, or arylaliphatic radical, Ar_1 represents a divalent aromatic radical, Ar_2 represents a trivalent aromatic radical and M represents an alkali metal, the units of the metal salt of the arylene-bis-(phenylenephosphinic acid)-4,4′-dicarboxyamide being present in a proportion of at least 2 per 100 units in the polymer.

3,919,171

PROCESS FOR PREPARING TERTIARY AMYL PHENOL SULFIDES IN A FRIABLE STATE

LeRoy Martin, Riverview, Mich., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 10, 1974, Ser. No. 432,257

Int. Cl.² C08F *28/00*; C08G *75/14*

U.S. Cl. 260—48 **9 Claims**

1. The process for producing friable para tertiary amyl phenol sulfides comprising

introducing sulfur monochloride to molten para tertiary amyl phenol in a reactor at a mole ratio of the said phenol to sulfur monochloride within the range of 0.7 to 0.95 to 1 while agitating the reaction mixture,

adding the said sulfur monochloride to the reaction mixture as fast as possible but at a rate which prevents the exothermic reaction from exceeding the maximum temperature of 200°C.,

continuously venting hydrogen chloride from the reactor as it evolves from the liquid reaction mixture until the reaction is complete, and finally

discharging friable para tertiary amyl phenol sulfides from the reactor.

3,919,172

METHOD OF PREPARING POLYESTERS FROM POLYMERIC POLYOLS AND DIANHYDRIDES

Robert A. Rhein, and John D. Ingham, both of La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 30, 1972, Ser. No. 301,794

Int. Cl. C08g *17/10*

U.S. Cl. 260—75 R **14 Claims**

1. A method of forming a polymer having a molecular weight of at least 20,000 comprising the steps of:

reacting at a temperature less than 100°C a liquid polymeric polyol having a molecular weight of from 1,000 to 5,000 and a functionality of from 1.7 to 3.0 with a tetrafunctional organic dianhydride in which the dianhydride is present in a stoichiometric excess amount of less than 10% in the presence of a catalytic amount of a metal acetyl acetonate to form said polymer.

3,919,173

MOISTURE CURABLE POLYURETHANE SYSTEMS

Robert N. Coyner, Hopkins, and Peter Skujins, Minneapolis, both of Minn., assignors to ConTech, Inc., Minneapolis, Minn.

Filed Nov. 23, 1973, Ser. No. 418,192

Int. Cl.² C08G *18/02*, *18/12*

U.S. Cl. 260—77.5 AT **15 Claims**

13. A process according to claim 12 wherein said moisture-curable polyurethane composition has a viscosity less than 800,000 centipoise at 25°C.

3,919,174
SINGLE PACKAGE 100 PERCENT SOLIDS URETHANE COATING COMPOSITIONS

Robert Arthur Taller, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,278
Int. Cl.² C08G *18/24*
U.S. Cl. 260—77.5 AB **20 Claims**

1. A single package liquid 100 percent solids composition of extended potlife consisting essentially of:

I. an organic polyisocyanate;

II. a polyol comprising

a. from about 10 to about 100 mole percent of a polycaprolactone polyol, polyether polyol or polyester polyol having an average molecular weight of from about 300 to about 4,000 and containing from 2 to 6 hydroxyl groups and,

b. from 0 to about 90 mole percent of an alkylene glycol of from 2 to 12 carbon atoms or a mixture of an alkylene glycol and an alkanolamine of from 2 to 12 carbon atoms;

III. from about 0.001 to about 0.5 weight percent of a dialkyltin diacylate catalyst in which the alkyl group contains from 2 to 8 carbon atoms and the acylate group contains from 2 to 20 carbon atoms and which is soluble in said coating composition; and

IV. from about 0.05 to about 3 weight percent of an organic carboxylic acid having from 1 to about 15 carbon atoms, wherein the mole ratio of III to IV is from about 0.001:1 to about 0.1:1.

3,919,175
METHOD OF ANIONIC POLYMERIZATION AND COPOLYMERIZATION OF LACTAM OF ω-AMINOCARBOXYLIC ACIDS

Jaroslav Králíček, Prague; Vladimir Kubánek, Kralupy Nad Vltavou, and Jaroslava Kondelikova, Prague, all of Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed Jan. 19, 1973, Ser. No. 325,088
Claims priority, application Czechoslovakia, Jan. 14, 1972, 276-72
Int. Cl.² C08G *69/20*
U.S. Cl. 260—78 L **1 Claim**

1. A method of anionically polymerizing at least one lactam of an omega-aminocarboxylic acid to a moldable polymer, wherein as catalysts are used alkali metal alkoxyhydroaluminates of the general formula

$$Me\,ALHaZ_{(4-o)}$$

Me being an alkali metal atom, a being an integer ranging from 0 to 3 and Z being a group —O—A—X—R_m or —O—R, wherein R is a lower alkyl, A is —CR^1R^2—$(CH_2)_n$—, R^1 and R^2 standing for either a hydrogen atom or a methyl group, *n* being an integer ranging from 2 to 6, X being either oxygen, sulphur or nitrogen, and *m* being 1 if X is either oxygen or sulphur, and 2 if X is nitrogen.

3,919,176
WATER-DISPERSIBLE POLYOLEFIN COMPOSITIONS USEFUL AS HOT MELT ADHESIVES

Max F. Meyer, Jr.; Richard L. McConnell, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,658
Int. Cl.² C08F *18/14;* **C08G** *63/00;* **C08K** *5/06;* **C08F** *218/14*
U.S. Cl. 260—78.4 D **19 Claims**

1. Water-dispersible polyolefin compositions particularly useful as hot melt adhesive compositions for use on repulpable paper products comprising an esterified carboxylated polyolefin prepared by reacting a carboxylated polyolefin having a saponification number of from about 10 to about 160 with from 10 to 100 mole percent of monohydroxypolyether compounds of the formula:

$$HOCH_2CH_{2x}OR$$

wherein R is a hydrocarbyl radical containing 1 to 24 carbon atoms and *x* is an integer from 2 to 500.

3,919,177
P-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

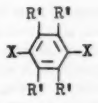
Continuation-in-part of Ser. No. 416,776, Nov. 19, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,450
Int. Cl.² C08G *75/14*
U.S. Cl. 260—79.1 **45 Claims**

1. A method of producing polymers comprising:

a. forming a composition by contacting at least one sulfur source, at least one p-dihalobenzene, at least one organic amide, at least one base and at least one alkali metal carboxylate, said sulfur source being selected from the group consisting of:

1. thiosulfates selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium thiosulfates;
2. substituted and unsubstituted thioureas;
3. acyclic and cyclic thioamides;
4. elemental sulfur;
5. carbon disulfide and carbon oxysulfide;
6. thiocarbamates;
7. monothiocarbonates, dithiocarbonates and trithiocarbonates;
8. mercaptans, mercaptides and sulfides having an alpha or beta activating substituent;
9. phosphorus pentasulfide; and
10. alkali metal bisulfides, and said alkali metal

carboxylate has the formula RCO_2M wherein R is a hydrocarbyl radical and M is an alkali metal, and said p-dihalobenzene has the formula



wherein each X is selected from the group consisting of chlorine, bromine, and iodine, and each R′ is selected from the group consisting of hydrogen and hydrocarbyl with the proviso that in at least 50 mole percent of the p-dihalobenzene employed each R′ must be hydrogen, and

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,919,178
METHOD OF MANUFACTURING POLYMER GRAFT-POLYMERIZED ONTO WATER SOLUBLE INORGANIC SUBSTANCE

Tadashi Yamaguchi, Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,664
Claims priority, application Japan, Feb. 24, 1972, 47-19528
Int. Cl.² C08F *28/00;* **C08G** *75/00;* **C08F** *120/02*
U.S. Cl. 260—79.3 R **8 Claims**

1. A method of preparing a polymer graft-polymerized onto a water-soluble inorganic salt, which comprises the steps of: mixing

a. particles of a water-soluble inorganic salt selected from the group consisting of sodium bicarbonate, sodium carbonate and sodium sulfite, said particles being suspended in an organic liquid which is a non-solvent for said salt and which is a solvent for solution polymerization of the below-mentioned monomer,

b. at least one monomer capable of radical polymerization, to form a reaction mixture of (a) and (b),

feeding sulfur dioxide gas into said reaction mixture and reacting said sulfur dioxide with said particles of said salt to transform portions of said salt into a different water-soluble inorganic salt as a reaction product, and simultaneously forming active radical sites on said particles;

maintaining said mixture under polymerizing conditions effective to polymerize said monomer onto said active sites to form solid particles of a polymer of said monomer grafted onto nuclei of said particles;

and then recovering the polymerization product particles from the reaction system.

3,919,179
THREE-COMPONENT ACCELERATOR SYSTEM

Frank S. Maxey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1972, Ser. No. 245,194

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

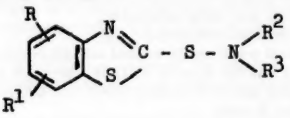
Int. Cl. C08c *11/56, 11/62;* **C08d** *9/00*

U.S. Cl. 260—79.5 C **8 Claims**

1. A sulfur vulcanizable rubber containing 0.00 to 3.25 parts of free sulfur per 100 parts by weight of rubber and 0.50 to 5.50 parts by weight of an accelerator system per 100 parts by weight of rubber, said accelerator system comprising

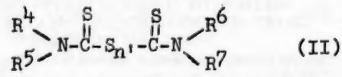
A. 2-(morpholinodithio)-benzothiazole, and

B. at least one benzothiazole accelerator having the following structural formula



wherein R and R^1 are selected from the group consisting of hydrogen, nitro, chloro, alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms and wherein R^2 is selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms and aryl radicals having from 6 to 12 carbon atoms, wherein R^3 is selected from hydrogen and the radicals for R^2, and R^2 and R^3 can be joined through a member selected from the group consisting of $-CH_2-$, $-O-$ and $-S-$ to constitute with the attached nitrogen group of heterocyclic radical and

C. a thiuram accelerator having the following structural formula



(II)

wherein R^4 and R^6 are selected from the group consisting of alkyl radicals having from 1 to 4 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms and aralkyl radicals having from 7 to 13 carbon atoms, R^5 and R^7 are selected from the group consisting of R^4, R^6 and aryl radicals having from 6 to 12 carbon atoms and R^4 and R^5, and R^6 and R^7 can be joined through a member of the group consisting of $-CH_2-$, $-O-$ and $-S-$ to constitute with the attached nitrogen group a heterocyclic radical and n' is an integer of a value from 1 to 4, wherein the weight ratio of A/B/C is 20 to 70/10 to 60/10 to 60 based on 100 parts by a weight of A, B and C and wherein the sum of the weights of the accelerator system and the sulfur is from 2.25 to 5.50 parts by weight per 100 parts by weight of rubber.

3,919,180
METHOD OF PRODUCING ALTERNATING COPOLYMERS OF DONOR MONOMER AND ACCEPTOR MONOMER FROM NOT LESS THAN THREE MONOMERS

Junji Furukawa, Kyoto; Yutaka Iseda; Kazuo Haga, both of Uji, and Koichi Irako, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 222,392, Jan. 31, 1972, abandoned, which is a continuation of Ser. No. 837,619, June 30, 1969, abandoned. This application Aug. 17, 1973, Ser. No. 389,185

Claims priority, application Japan, July 3, 1968, 43-45840

Int. Cl.² C08F *4/12, 4/16, 4/20, 4/52*

U.S. Cl. 260—80.7 **22 Claims**

1. A method of producing multi-component alternating copolymers having a ratio of the total moles of donor monomer units selected from the group consisting of conjugated dienes, aryl-substituted ethylenically unsaturated hydrocarbons and isobutylene to the total moles of acceptor monomer units selected from the group consisting of acrylonitrile, methacrylonitrile and esters of α,β-unsaturated monocarboxylic acids being 1:1, said donor monomer units and said acceptor monomer units being bonded alternately, which comprises

copolymerizing a monomer (a) selected from the group consisting of conjugated dienes having 4 to 10 carbon atoms,

a conjugated polar ethylenically unsaturated monomer (b) selected from the group consisting of acrylonitrile, methacrylonitrile and esters of α,β-unsaturated monocarboxylic acids, and

at least one monomer (c) selected from the group consisting of acrylonitrile, methacrylonitrile, esters of α,β-unsaturated monocarboxylic acids, conjugated dienes, arylsubstituted ethlenically unsaturated hydrocarbons and isobutylene, said monomer (c) being different from the monomers (a) and (b),

at a temperature of −100°C to 100°C in a non-aqueous liquid medium,

under an inert gas

at a pressure from one determined by vapor pressure in the reaction system to 50 atm

in the presence of a catalyst prepared from

a component (A): at least one transistion metal compound selected from compounds of vanadium and titanium and a component (B): an aluminum-containing component selected from the group consisting of aluminum compounds having the general formulae:

$$AlR_2X,\ Al_2R_3X_3 \text{ and } AlRX_2$$

and a combination of two or more aluminum compounds having the general formulae

$$AlR_2X,\ Al_2R_3X_3,\ AlRX_2\ AlR_3 \text{ and } AlX_3$$

wherein R represents a hydrocarbon radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals having 1 to 20 carbon atoms, and X represents a halogen radical selected from the group consisting of F, Cl, Br and I radicals, in which said component (B) the ratio (d) of the total number of the hydrocarbon radicals to the total number of halogen radicals satisfied the requirement that

$$O < d \leqq 2.0 \qquad (1)$$

and R and X in the aluminum compounds constituting said component (B) may be the same or different, said catalyst being prepared after complexing at least one of the components (A) and (B) with a basic organic compound selected from the group consisting of organic nitriles, α,β-unsaturated carboxylic acid esters, benzoic acid esters, aryl tertiary amines, aryl alkyl tertiary amines and thiophene, the amount of said basic organic compound being 1.0 ~ 1.125 mol based upon component (A) or (B),

the transition metal atom in said component (A) being present in an amount of $1/10^6$ to 2 g-atom based upon 1 g-atom of Al in said component (B), the total amount of metal atoms in the components (A) and (B) being $1/10^5$ to 1/2 g-atom based upon 1 mole of the fed monomers.

3,919,181
PREPARATION OF HYDROCARBON RESINS USING ZIRCONIUM TETRACHLORIDE

Kenneth C. Petersen, Scotia, and Royal A. Meader, Jr., Amsterdam, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,455
Int. Cl.² C08F *4/16, 12/08, 36/00*
U.S. Cl. 260—80.78 **34 Claims**

1. A process of preparing a light colored aromatic vinyl resin comprising polymerizing a member of the group consisting of (1) as the sole monomer styrene, alpha-methyl styrene, alpha-pinene, beta-pinene, dipentene limonene or p-t-butyl styrene; (2) a mixture of (a) styrene and (b) alpha-methyl styrene; or (3) a mixture of (a) styrene, (b) alpha-methyl styrene and (c) as a third monomer a member of the group consisting of alpha-pinene, beta-pinene, dipentene limonene, p-t-butyl styrene and vinyl toluene; or (4) a mixture of (a) styrene, (b) alpha-methyl styrene, (c) polymerizable terpene selected from the group consisting of alpha-pinene, beta-pinene, dipentene and limonene and (d) p-t-butyl styrene, in the presence of zirconium tetrachloride as a catalyst.

3,919,182
METHOD FOR PREPARING ALTERNATING COPOLYMERS USING A FRIEDEL-CRAFTS CATALYST AND A FREE RADICAL INITIATOR IN AN AQUEOUS MEDIUM

Norman G. Gaylord, New Providence, N.J., assignor to Gaylord Research Institute, Inc., Newark, N.J.

Division of Ser. No. 302,964, Nov. 1, 1972, Pat. No. 3,864,319, which is a continuation-in-part of Ser. No. 66,887, Aug. 25, 1970, abandoned. This application Nov. 22, 1974, Ser. No. 526,202
Int. Cl.² C08F *1/62, 1/60, 3/68, 3/76*
U.S. Cl. 260—85.5 R **11 Claims**

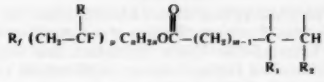
1. In a process for preparing equimolar alternating copolymers by copolymerization of a hydrocarbon electron donating monomer consisting of monoolefins with an electron accepting monomer selected from the group consisting of alkyl and aryl acrylates and methacrylates, acrylonitrile and methacrylonitrile, the improvement which comprises carrying out said copolymerization at a temperature within the range of about 0° to 100°C., in an aqueous medium containing 0.01 to 5 moles per mole of electron accepting monomer of a Friedel-Crafts halide which is at least divalent and stable to hydrolysis at the reaction temperature and 0.001 to 10% by weight based on the weight of the monomers of a water-soluble peroxygen compound free radical initiator.

3,919,183
PERFLUOROALKYL GROUPS CONTAINING POLYMERISATION PRODUCTS

Horst Jager, Bettingen, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,522
Claims priority, application Switzerland, Sept. 12, 1973, 13054/73
Int. Cl.² C08F *3/64, 3/66, 15/16*
U.S. Cl. 260—86.1 R **15 Claims**

1. Homopolymers which contain about 10 to 400 recurring units of the formula



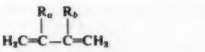
wherein R_f represents an unbranched or branched perfluoroalkyl radical with 3 to 12 carbon atoms,
R represents hydrogen or fluorine,
R_1 and R_2 represents hydrogen or methyl and
m is 1 or 2,
n is a whole number from 2 to 12, and
p is a whole number from 1 to 3.

3,919,184
NOVEL ACETYLENE-CONJUGATED DIENE COMPOUND LINEAR RANDOM COPOLYMERS AND A METHOD OF PRODUCTION THEREOF

Junji Furukawa, Kyoto; Eiichi Kobayashi, and Takahiro Kawagoe, both of Uji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 417,205
Claims priority, application Japan, Nov. 21, 1972, 47-117303; Mar. 17, 1973, 48-31254
Int. Cl. C08f *23/00*
U.S. Cl. 260—87.5 R **16 Claims**

5. A method for producing acetylene-conjugated diene copolymers, in which acetylene and a conjugated diene compound are bonded linearly and randomly, the conjugated diene compound is bonded in 1,4-type and the acetylene content is less than 70 mol%, which comprises copolymerizing (1) acetylene and (2) a conjugated diene compound having the general formula



where R_a and R_b represent hydrogen, halogen atom or hydrocarbon residue having 1–6 carbon atoms by means of a catalyst consisting of

A. at least one of dialkylaluminum chlorides having the general formula

$$R_2AlCl$$

wherein R represents hydrocarbon residue having 1–6 carbon atoms, or a reaction mixture of at least one of aluminum chloride compounds having the general formula

$$R'_{3-n}AlCl_n$$

wherein R′ represents hydrocarbon residue having 1–6 carbon atoms and *n* is 3, 2 or 1.5 with at least one of trialkylaluminum compounds having the general formula

$$R''_3Al$$

wherein R″ represents hydrocarbon residue having 1–6 carbon atoms, the molar ratio of the sum of R′ and R″ to Cl being 1.8–2.2 and

B. at least one of organic acid salts and organic complexes of nickel, the molar ratio of Al atom in (A) component to Ni atom in (B) component being 1–100, in a solvent selected from the group consisting of aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons and halogen derivatives thereof at a temperature of −80°C +100°C, the composition of acetylene based on the total monomer feed amount being less than 60 mol%.

3,919,185

PROCESS FOR POLYMERIZING OLEFINS

Saburo Takebe, Tsuchiura; Toshizo Abe, Kurashiki; Nobuaki Goko, Tokyo; Sunao Ushio, Yokohama, and Shigeo Go, Kurashiki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 12, 1973, Ser. No. 322,911

Claims priority, application Japan, Jan. 22, 1972, 47-8561

Int. Cl.[2] C08F *10/02, 10/04, 4/16, 4/24*

U.S. Cl. 260—93.7 11 Claims

1. In a process for polymerizing an olefin by a slurry polymerization technique in a non-polar hydrocarbon diluent in the absence of oxygen and water in the presence of:

a. a Phillips catalyst of chromium oxide supported on a heat-resistant metal oxide or chromium oxide supported on a heat-resistant metal oxide with an organoaluminum compound, wherein the concentration of said catalyst ranges from 0.01 – 25 mg/l of Cr in said diluent and the concentration of said organoaluminum compound ranges from 0.01 – 30 mg/l; or

b. a Ziegler catalyst of a transition metal compound of Groups IV–VI of the Periodic Table with an organoaluminum compound supported on a carrier or a lower valent transition metal compound of Groups IV–VI of the Periodic Table with an organoaluminum compound, wherein the amount of said transition metal compound ranges from 0.5 – 20 mg/l in said diluent and the amount of said organoaluminum compound in said diluent ranges from 0.1 –200 mg/l, the improvement which comprises:

adding a modifier of a polyvalent metal salt having a molecular weight of at least 300 of an organic acid consisting of a mixture of polyvalent metal C_{14-18} alkylsalicylates and a polyvalent metal alkyl aliphatic dicarboxylate sulfonate, wherein the concentration of said polyvalent metal salt modifier ranges from 0.01 – 2 mg/l in said diluent.

3,919,186

METHOD OF RECOVERING CYTOBIOTIC GLOBULIN FROM SKIN TISSUE

Robert Ardry, Clamart, and Michel Robilliart, Paris, both of France, assignors to Societe Anonyme dite: Omnium Financier Aquitaine pour l'Hygiene et la Sante (SANOFI), Courbevoie, France

Continuation-in-part of Ser. No. 111,760, Feb. 1, 1971, abandoned, which is a continuation of Ser. No. 766,313, Oct. 9, 1968, abandoned. This application Dec. 4, 1972, Ser. No. 312,021

Claims priority, application France, Oct. 10, 1967, 67.123862

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R 1 Claim

1. A method of making a cytobiotic globulin for the treatment of a human burn condition, erythemia, papillary edema, cicatrization, parakeratosis, perleche, eczema, herpes, psoriasis, seborrhia, acne, staphylococcal infection, neuro-dermital or senile-skin condition, comprising the steps of:

macerating skin tissue of a healthy slaughterhouse animal or foetus in an aqueous solution containing 0.9% by weight sodium chloride to form a tissue homogenate containing cytobiotic globulins;

eluting said tissue homogenate with a citrate solution having a pH of about 3.1 to yield a protein solution;

precipitating impurities from said protein solution by treating it at a pH of about 6 to separate a first precipitate from said solution;

raising the pH of supernatant liquid to 7;

adding to said supernatant solution ammonium sulfate to form a second precipitate;

separating a globulin-containing solution from the latter;

dialyzing said globulin-containing solution to eliminate ammonium salt therefrom; and

extracting the cytobiotic globulin from the dialyzed globulin-containing solution, said skin tissue being macerated and washed in an aqueous solution containing 0.9% by weight sodium chloride for a period of about 1 hour, recovered from said aqueous solution, and washed with distilled water until free from water-soluble salts to form macerated tissue;

said macerated tissue being eluted with a citrate solution having a pH of about 3.1 to yield an elution solution;

the elution solution being brought to a pH of about 6 with sodium hydroxide whereby said first precipitate is formed, the first precipitate being removed by filtration; the filtrate being brought to a pH of about 7 with sodium hydroxide and about 1.85 M aqueous ammonium sulfate being added to form said second precipitate;

said second precipitate being dissolved in only sufficient distilled water for complete solubilization to yield globulin-containing solution;

said globulin-containing solution being dialyzed against distilled water to complete disappearance of the ammonium salt with formation of a further precipitate;

the further precipitate being separated from the dialyzed eluate, the dialyzed eluate being brought to a PH of about 6.3 with sodium monophosphate and passed through a diethylaminomethylcellulose column; and

the eluate being lyophilized after traversing said column.

3,919,187

SULFUR-CONTAINING COMPOSITIONS OF UNSATURATED ESTERS, THEIR USE AS ADDITIVES FOR LUBRICANTS AND THE LUBRICATING COMPOSITIONS CONTAINING THEM

Bernard Bourdoncle, Talence, and Bernard Sillion, Grenoble, both of France, assignors to Institut Francaise du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Oct. 29, 1973, Ser. No. 410,531

Claims priority, application France, Nov. 3, 1972, 72.39110; Dec. 1, 1972, 72.42980

Int. Cl.[2] C10M *1/38;* C07G *17/00*

U.S. Cl. 260—125 25 Claims

1. A sulfur-containing composition obtained by sulfurizing an ester composition having a degree of unsaturation of 0.20–0.55 double bonds per 100 grams, said ester being formed by total esterification of:

a. at least one aliphatic hydrocarbyl mono- or di-carboxylic acid means with

b. at least one aliphatic hydrocarbyl monohydric alcohol means consisting essentially of 70–100% by weight of at least one branched aliphatic hydrocarbyl unsaturated monohydric alcohol having about 1 ethylenic unsaturation and containing at least 8 carbon atoms and 0–30% by weight of at least one saturated aliphatic hydrocarbyl monohydric alcohol.

3,919,188

MONOAZO DYES OF THE BENZISOTHIAZOLE SERIES WHICH ARE NOT SOLUBLE IN WATER

Helmut Hagen, Frankenthal, and Guenter Hansen, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

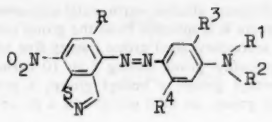
Filed Sept. 23, 1970, Ser. No. 74,915

Claims priority, application Germany, Sept. 27, 1969, 1948996; June 3, 1970, 2027201

Int. Cl.[2] C09B *29/08, 29/26;* D06P *3/54*

U.S. Cl. 260—158 3 Claims

1. A monoazo dye having the formula:



in which R denotes hydrogen, chlorine, bromine, cyano or nitro; R^1 denotes hydrogen, alkyl having one to four carbon atoms, benzyl; phenylethyl, hydroxyalkyl having two or three carbon atoms, β-methoxyethyl, β-ethoxyethyl, β-butoxyethyl, β-cyanoethyl, carboalkoxyethyl having a total of four to seven carbon atoms, β-chloroethyl, β-(β′-cyanoethoxy)-ethyl, β-acetylethyl, β-phenoxyacetoxyethyl, β-methylsulfonyloxyethyl, β-(β′-acetylacetoxy)-ethyl or γ-acetylaminopropyl; R^2 denotes alkyl having one to four carbon atoms, hydroxyalkyl having two to three carbon atoms, β-cyanoethyl, alkanoyloxyalkyl having four to six carbon atoms, phenyl, ethoxyphenyl, methoxyphenyl or cyclohexyl; R^3 denotes hydrogen, methoxy or ethoxy; and R^4 denotes hydrogen, chlorine, methyl, methoxy, ethoxy, acetylamino, propionylamino, chloroacetylamino or hydroxyacetylamino.

3,919,189

DECREASING BACTERIAL CONTAMINATION OF XANTHAN GUM WITH PROPYLENE OXIDE

Richard A. Empey, and David J. Pettitt, both of San Diego, Calif., assignors to Kelco Company, San Diego, Calif.

Filed Apr. 9, 1973, Ser. No. 348,899

Int. Cl.² C08B 37/00

U.S. Cl. 260—209 R **2 Claims**

1. A process for sterilizing particulate xanthan gum containing about 24,000 bacteria/gm. wherein said gum charge is tumble-intermingled with about 1.0 ounce per cubic foot of propylene oxide gas, based on the reactor volume, as essentially the only gas present, at about 105° F. for about 3 hours, and the propylene oxide gas is thereafter removed to obtain a sterilized xanthan gum product having about 1,800 bacteria/gm. and about 180 ppm of residual propylene oxide.

3,919,190

WATER INSOLUBLE ANTIBIOTIC METAL CELLULOSE COMPOUNDS AND PROCESS OF PREPARATION

Sidney Alan Barker, and John Frederick Kennedy, both of Birmingham, England, assignors to Ranks Hovis McDougall Limited, London, England

Filed Apr. 27, 1973, Ser. No. 354,958

Claims priority, application United Kingdom, May 3, 1972, 20617/72

Int. Cl.² C07H 15/22

U.S. Cl. 260—210 AB **12 Claims**

1. A process for the preparation of an active water insoluble antibiotic comprising reacting at a pH between 3 and 7 an antibiotic exhibiting antibacterial activity containing at least one amino group selected from the group consisting of streptomycin, paromomycin, gentamycin, kanamycin, neomycin, polymyxin, ampicillin and natamycin with a metal derivative of cellulose, said metal being selected from the group consisting of titanium, tin, zirconium, iron and vanadium.

3,919,191

14,15β-EPOXYCARDENOLIDE- AND 14,15β-EPOXYBUFADIENOLIDE-GLYCOSIDES AND PROCESS FOR THEIR PREPARATION

Werner Haede, Hofheim, Taunus; Kurt Radscheit, Kelkheim, Taunus; Ulrich Stache, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus, and Ernst Lindner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

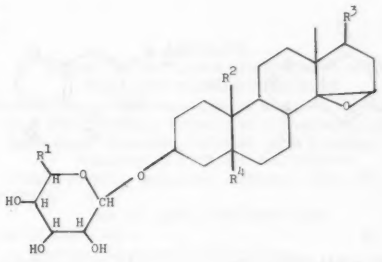
Filed July 21, 1972, Ser. No. 274,106

Claims priority, application Germany, July 22, 1971, 2136654

Int. Cl.² C07J 63/00

U.S. Cl. 260—210.5 **6 Claims**

1. A 3β-hydroxy-14,15β-epoxy-5β-cardenolide- or -5β-bufadienolide-glucoside or -rhamnoside of the formula



wherein R^1 is $-CH_3$ or $-CH_2OH$; R^2 is $-CH_3$, $-CH_2OH$, or formyl; R^3 is butenolide or cumaline; and R^4 is —H or —OH.

3,919,192

5-AMINO-4-SUBSTITUTED IMIDAZOLE NUCLEOTIDES

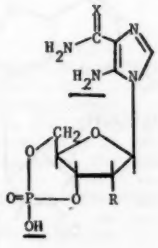
Rich B. Meyer, Laguna Beach, and Dennis A. Shuman, Mission Viejo, both of Calif., assignors to ICN Pharmaceuticals, Irvine, Calif.

Continuation-in-part of Ser. No. 255,804, May 22, 1972. This application Aug. 4, 1972, Ser. No. 277,868

Int. Cl.² C07H 19/04

U.S. Cl. 260—211.5 R **18 Claims**

1. A compound of the structure



wherein X is NH or NOR_1 where R_1 is H, C_1 to C_8 branched or linear alkyl or aralkyl and R is H, OH, or OR′ where R′ is C_1 to C_{18} acyl.

3,919,193

3-DEAZAGUANOSINE AND DERIVATIVES THEREOF

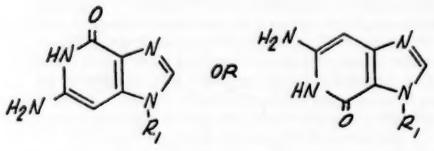
Abdul M. Mian, and Roland K. Robins, both of Santa Ana, Calif., assignors to ICN Pharmaceuticals, Irvine, Calif.

Filed July 6, 1973, Ser. No. 377,079

Int. Cl.² C07H *19/04*

U.S. Cl. 260—211.5 R **17 Claims**

1. A compound of the structure:



wherein R_1 is β-D-ribofuranose or 2′,3′,5′-O-C_1 to C_8 acylated analogs thereof.

3,919,194

S-SUBSTITUTED 2-THIOADENOSINE-5′-MONOPHOSPHATES AND PROCESS FOR PRODUCING THE SAME

Kiyomi Kikugawa; Hideo Suehiro, both of Kokubunji; Motonobu Ichino, and Tokuro Nakamura, both of Mitaka, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

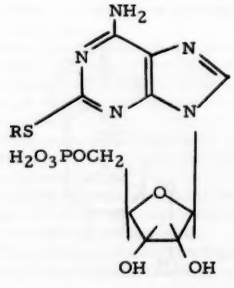
Filed July 10, 1973, Ser. No. 378,116

Claims priority, application Japan, Dec. 26, 1972, 47-129619; Dec. 26, 1972, 47-129620; Mar. 12, 1973, 48-27985; Mar. 23, 1973, 48-32703

Int. Cl.² C07H *19/20*

U.S. Cl. 260—211.5 R **18 Claims**

1. S-Substituted 2-thioadenosine-5′-monophosphates represented by the following general formula



and the alkali metal, alkaline earth metal and ammonium salts thereof, wherein R is selected from the group consisting of a primary or secondary alkyl group having five to 10 carbon atoms, a cycloalkyl group having 5 to 10 carbon atoms, a cycloalkylmethyl group, a benzyl group, a p-nitro- or p-chlorobenzyl group, an allyl group and a β- or γ-methallyl group.

3,919,195

PROCESS FOR PRODUCING 2,4-TOLUYLENEDIISOCYANATE DIMER

Mansur Idiatullovich Bakhitov, ulitsa Komarova, 4, kv. 86.; Evgeny Vasilievich Kuznetsov, ulitsa Aivazovskogo, 19, kv. 13., both of Kazan; Nina Nikolaevna Zolotarevskaya, prospekt Tsiolkovskogo, 17-a, kv. 16., Dzerzhinsk, Gorkovskoi oblasti; Nataliya Alexandrovna Popova, prospekt Tsiolkovskogo, 31, kv. 17., Dzerzhinsk,Gorkovskoi oblasti; Veniamin Grigorievich Golov, prospekt Pobedy, 3, kv. 11., Dzerzhinsk, Gorkovskoi oblasti; Jury Alexandrovich Rodionov, ulitsa Griboedva, 33, kv. 18., Dzerzhinsk, Gorkovskoi oblasti; Igor Ivanovich Molev, ulitsa Griboedva, 36, kv. 22., Dzerzhinsk, Gorkovskoi oblasti, and Vladimir Mortkovich Kotlyarsky, prospekt Pobedy, 3, kv. 34., Dzerzhinsk, Gorkovskoi oblasti, all of U.S.S.R.

Filed Oct. 3, 1973, Ser. No. 403,213

Int. Cl.² C07D *229/00*

U.S. Cl. 260—239 A **7 Claims**

1. A process for producing 2,4-toluylenediisocyanate dimer comprising dimerization of 2,4-toluylenediisocyanate at a temperature within the range of from 15 to 60°C in the presence of a trialkylphosphite as a catalyst in an amount of 2 to 5% by weight of 2,4-toluylenediisocyanate.

3,919,196

PENICILLIN ESTERS

Harry Ferres, and John Peter Clayton, both of Horsham, England, assignors to Beecham Group Limited, England

Division of Ser. No. 259,941, June 5, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,782

Claims priority, application United Kingdom, June 9, 1971, 19604

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **2 Claims**

1. The combination salt of 6[3-(2-chloro-6-fluorophenyl)-5-methyl isoxazole-4-carbamido]penicillanic acid and phthalide 6[D(−)α-amino-phenylacetamido] penicillanate.

3,919,197

PREPARATION OF BETA-ALKOXY-OMEGA-LACTAMS

Johan W. Garritsen, Sittard, and Josef M. Penders, Maastricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

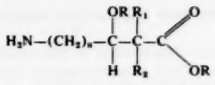
Filed Dec. 5, 1973, Ser. No. 422,007

Claims priority, application Netherlands, Dec. 8, 1972, 7216662

Int. Cl.² C07D *211/22, 223/08, 225/02*

U.S. Cl. 260—239.3 A **5 Claims**

1. A process for preparing a β-alkoxy-ω-lactam, comprising heating in the liquid phase an ω-amino-β-alkoxycarboxylic acid ester of the formula



wherein *n* is an integer of from 2 to 6, the two R groups which may be the same or different each represent an alkyl group or a cyclo-alkyl group, containing not more than 10 carbon atoms, and R_1 and R_2, which may be the same or different each represent hydrogen or an alkyl group or a cyclo-alkyl group containing not more than 10 carbon atoms.

2. A process according to claim **1**, wherein the ester starting material is according to the said general formula wherein *n* is 3 or 4, R represents a methyl-group or an ethyl group, the two R-groups are identical and R_1 and R_2 represent hydrogen.

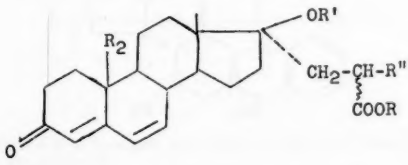
3,919,198

DIENIC DERIVATIVES OF THE ANDROSTANE SERIES AND PROCESS

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Feb. 1, 1974, Ser. No. 438,602
Claims priority, application France, Feb. 6, 1973, 73.04058
Int. Cl.² C07J *17/00*
U.S. Cl. 260—239.55 **20 Claims**

1. A dienic derivative of the androstane series having the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms and alkali metal, R′ and R″ are members selected from the group consisting of (1) hydrogen and —COOM, respectively, where M is alkali metal, and (2) taken together, the divalent

group, R_2 is a member selected from the group consisting of hydrogen and methyl, with the proviso when R is hydrogen or alkyl having 1 to 4 carbon atoms, R′ and R″ together are the divalent

group.

3,919,199

6-CYANOMETHYLENE-3β,5α-17-TRIHYDROXY-17α-PREGNANE-21-CARBOXYLIC ACID-γ-LACTONE AND INTERMEDIATES

George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed June 13, 1974, Ser. No. 478,917
Int. Cl.² C07J *19/00*
U.S. Cl. 260—239.57 **2 Claims**

1. 6-Cyanomethylene-3β,5α,17-trihydroxy-17α-pregnane-21-carboxylic acid γ-lactone.

2. 3β-Acetyloxy-6-cyanomethylene-5α,17-dihydroxy-17α-pregnane-21-carboxylic acid γ-lactone.

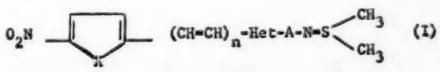
3,919,200

NOVEL NITROFURAN COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Grossachsen; Max Thiel; Wolfgang Vömel, both of Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany

Filed Sept. 5, 1972, Ser. No. 286,516
Claims priority, application Germany, Sept. 21, 1971, 2147013
Int. Cl. C09b *23/00*; C07 *51/04*
U.S. Cl. 260—240 A **21 Claims**

1. Nitrofuran compound of the formula



(I)

wherein

X is oxygen or sulfur;

A is a valency bond or an amino-methylene bridge;

n is 0 or 1; and

Het is thiazole, thiadiazole, pyridine, pyrimidine or pyridazine ring or s-triazolo-[4,3]-pyridazine.

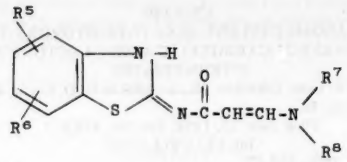
3,919,201

2-(β-AMINOACRYLOYL)IMINOBENZOTHIAZOLINES

Delme Evans, Chalfont St. Peter, England, assignor to Lilly Industries, Ltd., London, England

Division of Ser. No. 182,122, Sept. 20, 1971, Pat. No. 3,813,360. This application Oct. 29, 1973, Ser. No. 410,869
Claims priority, application United Kingdom, Sept. 30, 1970, 46404/70
Int. Cl.² C07D *277/82*
U.S. Cl. 260—240 J **7 Claims**

1. The compound of the formula



wherein

R^5 and R^6 independently are selected from the group consisting of hydrogen, C_1—C_6 alkyl, C_1—C_6 alkoxy and C_2—C_7 carbalkoxy,

and R^7 and R^8 taken separately are hydrogen or C_1—C_6 alkyl, and taken together with the adjacent nitrogen are pyrrolidino, piperidino or homopiperidino.

3,919,202

3-(SUBSTITUTED AMINO)-1H-ISOINDOLES

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

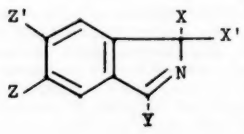
Division of Ser. No. 277,152, Aug. 2, 1972, Pat. No. 3,839,356, which is a continuation-in-part of Ser. No. 62,701, Aug. 10, 1970, Pat. No. 3,723,421. This application Feb. 25, 1974, Ser. No. 445,645

Claims priority, application Canada, Aug. 6, 1971, 120031

Int. Cl.[2] C07D *209/44*

U.S. Cl. 260—240 F **9 Claims**

1. 1-(X)-1-(X')-3-(Y)-5-(Z)-6-(Z')-1H-Isoindole of the formula



wherein:

X is hydrogen or atertiary alkyl of one to four carbon atoms;

X' is hydrogen;

Y is NQQ' or NHN=CRR';

wherein:

Q is amino or hydroxy;

Q' is hydrogen or atertiary alkyl of one to four carbon atoms;

R, when taken alone, is hydrogen, alkyl of one to six carbon atoms, alkenyl of two to six carbon atoms, cycloalkyl of three to seven ring atoms and three to ten carbon atoms, cycloalkenyl of five to seven ring atoms and five to ten carbon atoms, phenyl, phenylalkyl of seven to ten carbon atoms or phenylalkenyl of eight to twelve carbon atoms; R', when taken alone, is hydrogen or atertiary alkyl of one to four carbon atoms; or

R and R', when taken together with C, are cycloalkylidene of five to seven ring atoms and five to ten carbon atoms;

Z and Z', when taken alone, are the same or different and are hydrogen, atertiary alkyl of one to four carbon atoms, halo, hydroxy or atertiary alkoxy of one to four carbon atoms; or

Z and Z', when taken together, are methylenedioxy; and

wherein,

when R is phenyl, phenylalkyl or phenylalkenyl, the benzene ring thereof can be substituted by one to three members selected from the group consisting of halo, hydroxy, atertiary alkyl of one to four carbon atoms, atertiary alkoxy of one to four carbon atoms and phenylalkoxy of seven to ten carbon atoms or by a member selected from the group consisting of atertiary alkylthio of one to four carbon atoms, dialkylamino and β-dialkylaminoethoxy, wherein alkyl of dialkylamino is atertiary alkyl of one to four carbon atoms, nitro and sulfamoyl; or an acid addition salt thereof.

3,919,203

2-METHYL-2-[2-(1,2,3,4,-TETRAHYDRO-9-METHYL CARBAZOL-4-YLIDENE)-ETHYL]1,3-CYCLOPENTANE DIONE

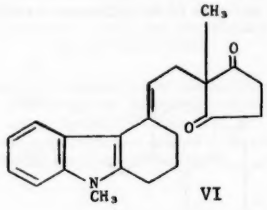
Jagadish C. Sircar, Dover, and Harold Zinnes, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 475,559, June 3, 1974. This application Feb. 18, 1975, Ser. No. 550,333

Int. Cl.[2] C07D *209/86*

U.S. Cl. 260—240 R **1 Claim**

1. A compound of the formula:



VI

3,919,204

FLUORINATED CEPHALOSPORINS

George A. Boswell, Jr., and David R. Brittelli, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

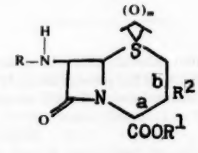
Filed Dec. 11, 1972, Ser. No. 314,024

Int. Cl.[2] C07D *501/20*

U.S. Cl. 260—243 C **39 Claims**

1. A compound of the formula

(I)



wherein:

m is zero or 1;

a and b are either a single or double bond with the proviso that b is a double bond only when $m = 0$ and a is a single bond;

R is H or

in which Q is phenylmethyl, 2-thienylmethyl, 3-[1,2,5-thiadiazolyl]methyl 3-[2,5,6-tricyanopyrazinyl]methyl or furfurylmethyl;

R^1 is H, diphenylmethyl or 2,2,2-trichloroethyl alkali metal, alkaline earth metal, and ammonium or amine salt; and

R^2 is CHF_2, CF_3 or COF; and

2. a pharmaceutically acceptable acid addition salt of (1).

3,919,205
DITHIOCARBONYLTHIOACETYL CEPHALOSPORIN DERIVATIVES

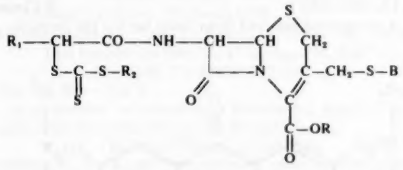
Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 272,228, July 17, 1972, Pat. No. 3,846,418, which is a continuation-in-part of Ser. No. 180,523, Sept. 14, 1971, abandoned. This application June 11, 1973, Ser. No. 368,801

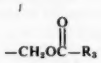
Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C **14 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(-lower alkyl)silyl,



or a salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine or N-lower alkylpiperidine; R_1 is phenyl, pyridyl, thienyl or furyl; R_2 and R_3 each is lower alkyl, phenyl or phenyl-lower alkyl; and B is a heterocyclic of the group consisting of thiazole, isothiazole, thiazole, oxazole, isoxazole, oxadiazole, triazole, thiatriazole, tetrazole and said heterocyclics bearing a lower alkyl group.

3,919,206
7-(HALOMETHYLARYL)ACETAMIDOCEPHALOSPORIN DERIVATIVES

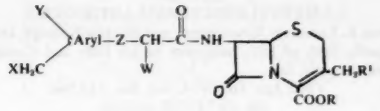
Abraham Patchornik, Ness-Ziona, and Fortuna Haviv, Rehovot, both of Israel, assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel

Filed Sept. 25, 1973, Ser. No. 400,560

Int. Cl.² C07D *501/28, 501/34;* **A61K** *31/545*

U.S. Cl. 260—243 C **17 Claims**

1. A compound of the formula



wherein Aryl is selected from phenyl or 2-thienyl; X is selected from chlorine, bromine or fluorine; Y is selected from hydrogen, chlorine, bromine, straight or branched lower alkyl of from 1 to 4 carbon atoms, lower alkoxy of from 1 to 4 carbon atoms, or $-CH_2X$ wherein X is selected from bromine, chlorine or fluorine, with the proviso that when Aryl represents 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen or sulfur with the proviso that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, hydroxy, amino, —COOH, or $-SO_3H$ with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R is selected from hydrogen or a pharmaceutically acceptable non-toxic cation; and R^1 is selected from hydrogen or acetoxy.

3,919,207
INTERMEDIATES FOR PRODUCING CEPHALOSPORINS

Shinji Terao, Toyonaka; Taisuke Matsuo; Susumu Tsushima, both of Suita; Toshio Miyawaki, Nishinomiya, and Norichika Matsumoto, Neyagawa, all of Japan, assignors to Takeda Chemical Co., Ltd., Japan

Filed Sept. 12, 1972, Ser. No. 288,343

Claims priority, application Japan, Sept. 13, 1971, 46-71086; June 6, 1972, 47-56235

Int. Cl.² C07D *501/18, 501/02;* **A61K** *31/545*

U.S. Cl. 260—243 C **5 Claims**

1. 7-Phenylthionacetamido-3-desacetoxycephalosporanic acid β-methylsulfonylethyl ester.

3,919,208
7-(CYANOMETHYLARYL)ACETAMIDE-CEPHALOSPORIN DERIVATIVES

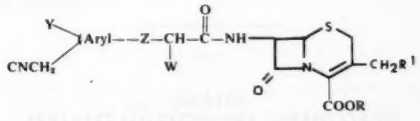
Abraham Patchornik, Ness-Ziona, and Fortuna Haviv, Rehovot, both of Israel, assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel

Filed Oct. 9, 1973, Ser. No. 404,414

Int. Cl.² C07D *501/28, 501/34;* **A61K** *31/545*

U.S. Cl. 260—243 C **12 Claims**

1. A compound of the formula



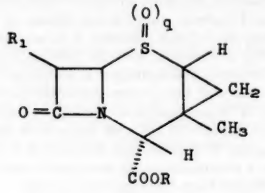
wherein Aryl is selected from phenyl or 2-thienyl; Y is selected from hydrogen, chlorine, bromine, straight or branched lower alkyl of from 1 to 4 carbon atoms, lower alkoxy of from 1 to 4 carbon atoms, or $-CH_2CN$ with the proviso that when Aryl represents 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen or sulfur with the proviso that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, hydroxy, amino, -COOH, or $-SO_3H$ with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R is selected from hydrogen or a pharmaceutically acceptable cation; and R_1 is selected from hydrogen or acetoxy.

3,919,209
2,3-METHYLENECEPHAM ANTIBIOTICS

Steven R. Lammert, Greenwood, and Stjepan Kukolja, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 16, 1974, Ser. No. 433,966
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C **18 Claims**

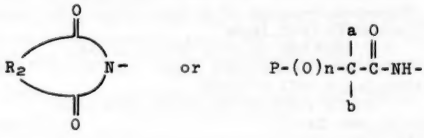
1. The compound of the formula



wherein

R is hydrogen, an alkali metal cation or a carboxylic acid protecting group;

R_1 is amino, C_1–C_7 alkanamido, benzamido, 2-carboxybenzamido, phthalisoimido or a group represented by the formula



wherein

R_2 is C_2–C_4 alkylene, 1,2-phenylene or 1,2-cyclohexenylene;

P is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, phenyl or substituted phenyl wherein the substituent is C_1–C_3 alkoxy, nitro, fluoro, chloro, bromo, iodo, or trifluoromethyl;

n is 0 or 1; *a* is hydrogen or C_1–C_3 alkyl; *b* is hydrogen, C_1–C_3 alkyl, hydroxy, protected hydroxy, amino, protected amino, carboxy or protected carboxy; with the limitation that when n is 1, P is phenyl or substituted phenyl wherein the substituent is C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, fluoro, chloro, bromo, iodo, or trifluoromethyl, and b is hydrogen or C_1–C_3 alkyl; and

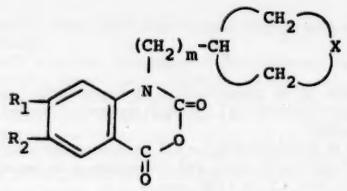
q is 1 or 0.

3,919,210
N-CYCLOALKYL AND N-CYCLOALKYLALKYL ISATOIC ANHYDRIDES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 324,996, Jan. 19, 1973, Pat. No. 3,887,559, which is a continuation-in-part of Ser. No. 163,105, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 87,016, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 828,757, May 28, 1969, Pat. No. 3,598,823. This application Dec. 23, 1974, Ser. No. 535,439
Int. Cl.² C07D *265/00, 273/00, 295/00*
U.S. Cl. 260—244 A **11 Claims**

1. A compound of the formula;



wherein

each of R_1 and R_2 is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both are alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, hydroxy or lower alkoxy of 1 to 2 carbon atoms.

m is 0, 1 or 2,

X is a direct bond or $-(CH_2)_y-$, and

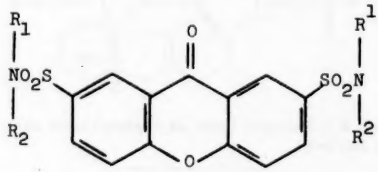
Y is 1, 2 or 3.

3,919,211
9-OXOXANTHENE-N,N'-BIS(SUBSTITUTED)-2,7-DISULFONAMIDES

Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 12, 1973, Ser. No. 331,392
Int. Cl. C07d *7/44, 29/34, 87/46*
U.S. Cl. 260—246 B **8 Claims**

1. A compound selected from those having the formula



(I)

wherein

R^1 is hydrogen or lower alkyl;

R^2 is lower alkoxy(lower)alkyl, di(lower)alkylamino (lower)alkyl, halobenzyl or morpholino(lower)alkyl; and

R^1 and R^2 taken together with the nitrogen of the sulfonamide group are piperidino, piperazino, phenylpiperazino and morpholino;

and their pharmaceutically acceptable acid-addition salts.

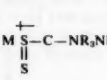
3,919,212
PREPARATION OF AMINECARBOTRITHIOATES

Joseph E. Dunbar, and Joan H. Rogers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 166,258, July 26, 1971, Pat. No. 3,810,890, which is a continuation-in-part of Ser. No. 682,511, Nov. 13, 1967, abandoned. This application Oct. 25, 1973, Ser. No. 409,550
Int. Cl.² C07C *155/00*; C07D *295/20*
U.S. Cl. 260—246 B **3 Claims**

1. Method for making an aminecarbotrithioate which comprises reacting at a temperature between about 20°C. and

about 150°C. a thiolsulfonate with an alkali metal or ammonium aminecarbodithioate salt in substantially equimolar proportions wherein the thiolsulfonate has the formula (1) $R_1SSO_2R_2$ or (2) $R_2SO_2SXSSO_2R_2$ wherein R_1 represents alkenyl, loweralkylalkenyl or haloalkenyl, phenylalkenyl, 2-(loweralkylthio)ethyl, 2-(arylthio)ethyl, (loweralkoxy)-methyl, 2-(loweralkoxy)ethyl, 2-(aryloxy)ethyl, loweralkylor halo- (arylthio)ethyl, loweralkyl- or halo- (aryloxy)methyl, propargyl, phenyl, nitrophenyl, dinitrophenyl, loweralkyl- or halophenyl, C_1 — C_{20} alkyl, benzyl, o-, m-or p- loweralkylbenzyl, loweralkylthiomethyl, arylthiomethyl or haloarylthiomethyl, R_2 represents loweralkyl, aryl or alkyl- or halo-substituted aryl and X represents phenylene, xylylene, polymethylene or thiodiethylene and wherein the aminecarbodithioate has formula



wherein M^+ represents an alkali metal or ammonium cation and R_3 and R_4 individually represent hydrogen or loweralkyl and together represent the remaining portion of a heterocyclic ring containing the nitrogen atom.

3,919,213
PROCESS FOR BROMINATING A SULFO ACETAMIDE

Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 330,612, Feb. 8, 1973, Pat. No. 3,862,935. This application Sept. 3, 1974, Ser. No. 502,708

Int. Cl.² C07D *295/18*

U.S. Cl. 260—246 B **1 Claim**

1. A method for preparing a brominated amide of sulfoacetic acid corresponding to the formula

$$R_1R_2NCOCBr_xH_{2-x}SO_2NR_1R_2$$

wherein R_1 and R_2 are independently selected from hydrogen and lower alkyl or, in conjunction with the nitrogen atom, form pyrrolidino, piperidino, morpholino, 4-methyl piperidino or 2,6-dimethyl morpholino, and x is an integer from 1 to 2, which comprises the step of brominating an amide of sulfoacetic acid corresponding to the formula

$$R_1R_2NCOCH_2SO_2NR_1R_2$$

wherein R_1 and R_2 have the meaning previously given by mixing in the presence of aqueous hydrobromic acid as reaction medium substantially equimolar proportions of bromine and a said sulfoacetic acid amide corresponding to the last formula to obtain a mono-brominated sulfoacetic acid amide, and mixing in excess of 2 molar proportions up to about 5 molar proportions of bromine per molar proportion of the indicated sulfoacetic acid amide to obtain a dibrominated sulfoacetic acid amide and recovering the said brominated sulfoacetic acid amide.

3,919,214
1,2,4-BENZOTRIAZINIUM-DYESTUFFS

Klaus Leverenz, Leverkusen, and Karl-Heinz Schundehutte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

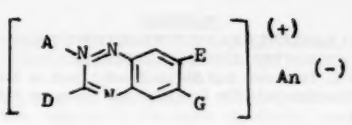
Filed Aug. 22, 1973, Ser. No. 390,374

Claims priority, application Germany, Aug. 22, 1972, 2241259

Int. Cl.² C07D *253/08*

U.S. Cl. 260—248 AS **8 Claims**

1. Dyestuff of the formula



A = benzene, naphthalene, 1,2-methylenedioxybenzene, benzodioxane, benzothiazole, benztriazole, dibenzofurane, carbazole, benzimidazole, indazole, 1,2,3,4-tetrahydroquinoline, N-ethylcarbazole, methylbenzthiazole, methylbenzimidazole, methylindazole, benzyl-1,2,3,4-tetrahydroquinoline, ethoxynaphthalene, methoxynaphthalene, acetylaminonaphthalene, aminodiphenylensulfide, diphenyloxide, or benzene substituted by methyl, chloro, trifluoromethyl, nitro, ethoxycarbonyl, sulphonylmethyl, N,N-dimethylsulphonamide, phenoxysulphonyl, methoxy, ethoxy, butoxy, benzyloxy, phenoxy, acetyamino, methoxycarbonylamino, ureido, thioureido, hydroxyethoxy, ethoxycarbonylmethoxy, N-ethyl-N-acetylamino, benzoylamino, propionylamino, methylsulphonylamino, dimethylamino, phenylamino, ethoxyphenylamino, ethylsulphonyl, benzylsulphonyl, ethoxycarbonyl, dimethylaminobenzotriazolylphenoxy, N-methyl-N-phenylamino, or methylphenoxy;

D = H, NH_2, C_1-C_6-alkyl, phenyl, naphthyl, C_1-C_6-alkoxy, phenyloxy, naphthyloxy, furyl, thienyl, pyridyl;

E = H, C_1-C_6-alkyl, phenyl, naphthyl, C_1-C_6-alkoxy, phenyloxy, naphthyloxy, furyl, thienyl, pyridyl;

E = H, C_1-C_6-alkyl, halogen, C_1-C_6-alkoxy, phenyloxy, naphthyloxy, benzyloxy;

G = C_1-C_6-alkoxy or

R_1 = hydrogen, C_1-C_4-alkyl, methylcarbonyloxy, ethylcarbonyloxy, benzyl, phenethyl, or C_1-C_4-alkyl substituted by chloro, hydroxy, or cyano;

R_2= C_1-C_4-alkyl, phenyl, benzyl, phenethyl, or C_1-C_4-alkyl substituted by chloro, hydroxy, or cyano. An (+) = anion.

3,919,215
3-(2-ACYLAMINOPHENYL)-1,2,4-TRIAZINES

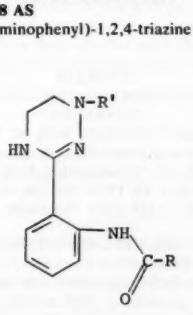
Donald L. Trepanier, and Shyam Sunder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,575

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **4 Claims**

1. A 3-(2-acylaminophenyl)-1,2,4-triazine corresponding to the formula:



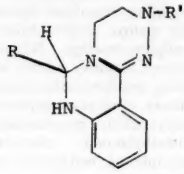
wherein R represents phenyl or substituted phenyl having one, two or three substituents selected from halo, cyano, and loweralkyl or loweralkoxy of one to three carbon atoms, and R' represents loweralkyl of one to three carbon atoms.

3,919,216
6-(ALKYL)-3,4,6,7-TETRAHYDRO-1,2,4-TRIAZINOQUINAZOLINES

Donald L. Trepanier, and Shyam Sunder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,576
Int. Cl.² C07D *253/08*
U.S. Cl. 260—248 AS 5 Claims

1. A 1,2,4-triazino quinazoline selected from compounds corresponding to the formula:



wherein R represents alkyl of one to eight carbon atoms, and R′ represents loweralkyl of one to three carbon atoms and their pharmaceutically-acceptable acid addition salts.

3,919,217
CHLOROCYANURIC ACID MANUFACTURE

Duane L. Sawhill, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed July 20, 1972, Ser. No. 273,655
Int. Cl.² C07D *251/28*
U.S. Cl. 260—248 C 8 Claims

1. The method of preparing chlorocyanuric acid which comprises reacting chlorine with a first aqueous suspension of alkali metal bicarbonate and cyanuric acid to form a second aqueous suspension of solid chlorocyanuric acid in a solution of an alkali metal chloride having a pH below 5 and separating said solid chlorocyanuric acid from said solution.

3,919,218
STABLE POLYISOCYANATES AND PROCESS THEREFOR

Karl Schmitt; Josef Disteldorf, both of Herne, and Felix Schmitt, Herten-Langenbochum, all of Germany, assignors to Veba Chemie AG, Gelsenkirchen-Buer, Germany

Filed May 20, 1974, Ser. No. 471,723
Claims priority, application Germany, May 22, 1973, 2325826
Int. Cl.² C07D *251/04*
U.S. Cl. 260—248 NS 5 Claims

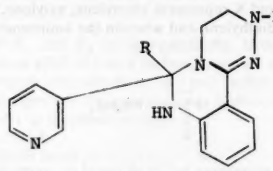
1. Method for preparing stable isocyanato isocyanurate which comprises trimerizing alkyl or cycloalkyl isocyanates having 4–18 carbon atoms with aziridine or substituted aziridines as catalyst and trialkylamines with 1–5 carbon atoms in the alkyl groups as co-catalyst and terminating the polymerization by destroying said catalyst by thermic treatment at temperatures between 80° and 200°C, and simultaneously or subsequently separating said co-catalyst by distillation.

3,919,219
6-PYRIDYL-TETRAHYDRO-1,2,4-TRIAZINOQUINAZOLINES

Donald L. Trepanier, and Shyam Sunder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,701
Int. Cl.² C07D *253/08*
U.S. Cl. 260—248 AS 4 Claims

1. A 1,2,4-triazino quinazoline corresponding to the formula:



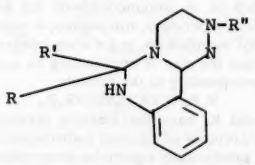
wherein R represents hydrogen or loweralkyl of one to three carbon atoms, and R′ represents loweralkyl of one to three carbon atoms, and their pharmaceutically-acceptable acid addition salts.

3,919,220
6-(PHENYL AND SUBSTITUTED PHENYL)TETRAHYDRO-1,2,4-TRIAZINOQUINAZOLINES

Donald L. Trepanier, and Shyam Sunder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,702
Int. Cl.² C07D *253/08*
U.S. Cl. 260—248 AS 6 Claims

1. A 1,2,4-triazino quinazoline selected from compounds corresponding to the formula:



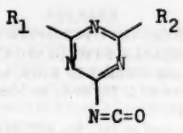
wherein R represents phenyl, naphthyl, acetamidophenyl, or substituted phenyl having one, two or three substituents selected from nitro, halo, hydroxy, cyano, loweralkyl, loweralkoxy, amino, or mono- or diloweralkyl amino, R′ represents hydrogen or loweralkyl and R″ represents loweralkyl in which, in all occurrences thereof; the loweralkyl and loweralkoxy moieties are of one to three carbon atoms, and their pharmaceutically-acceptable acid addition salts.

3,919,221
PROCESS FOR THE MANUFACTURE OF S-TRIAZINYL-ONOISOCYANATES OR S-TRIAZINYL-DIISOCYANATES

Joachim Dazzi, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

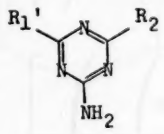
Filed Feb. 15, 1974, Ser. No. 443,060
Claims priority, application Switzerland, Mar. 1, 1973, 3003/73
Int. Cl.² C07D *251/16, 251/18, 251/44, 251/48*
U.S. Cl. 260—249.5 7 Claims

1. A process for the manufacture of s-triazinyl-monoisocyanates or s-triazinyl-diisocyanates of the formula I



(I)

wherein R_1 represents the isocyanate group, a halogen atom, an alkoxy radical or alkylthio radical with 1–6 carbon atoms or a N,N-dialkylamino radical with 1–4 carbon atoms in each of the alkyl radicals and R_2 represents a halogen atom, a phenyl radical, an alkyl radical with 1–18 carbon atoms, an alkoxy or alkylthio radical with 1–6 carbon atoms or a N,N-dialkylamino radical with 1–4 carbon atoms in each of the alkyl radicals, characterised in that s-triazinyl-monoamines or s-triazinyl-diamines of the formula II



(II)

wherein R_1' represents a $-NH_2$ group, a halogen atom, an alkoxy or alkylthio radical with 1–6 carbon atoms or a N,N-dialkylamino radical with 1–4 carbon atoms in each of the alkyl radicals and R_2 has the meaning indicated under the formula I, is reacted with phosgene in a 3-alkoxypropionitrile with 1–4 C atoms in the alkoxy radical, in nitrobenzene, in sulpholane or in o-dichlorobenzene and, if appropriate, in the presence of a catalyst, at a temperature not below 150°C.

3,919,222

PROCESS FOR PREPARING AN INTERMOLECULAR COMPOUND OF 2-METHYLTHIO-4-ETHYLAMINO-6-TERT.BUTYL-AMINO-S-TRIAZINE AND AN ASYMMETRICALLY SUBSTITUTED CHLOROTRIAZINE

Jürg Eichenberger, Munchenstein; Norbert Perlhefter, Allschwil, and Pierre-André Bôle, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 166,605, July 27, 1971, Pat. No. 3,859,076. This application May 21, 1974, Ser. No. 472,021

Claims priority, application Switzerland, July 31, 1970, 11591/70

Int. Cl.² C07D *251/52*

U.S. Cl. 260—249.8 **7 Claims**

1. A process for producing an intermolecular compound of (A) 2-methylthio-4-ethylamino-6-tert.butylamino-s-triazine and (B) one or more asymmetrically substituted chlorotriazines selected from the group consisting of 2-chloro-4-ethylamino-6-tert.butylamino-s-triazine, 2-chloro-4-ethylamino-6-sec.butylamino-s-triazine, 2-chloro-4-ethylamino-6-(2'-cyanopropyl-(2')-amino)-s-triazine and 2-chloro-4-ethylamino-6-isopropylamino-s-triazine, which process comprises the steps of (1) heating from 10 to 99% by weight of (A) and from 90 to 1% by weight of (B) to a temperature of about 110°–150°C to obtain a molten mass, (2) rapidly cooling the molten mass to a temperature of about 100–110°C at a cooling rate of 10°C per minute, (3) slowly cooling the molten mass at a cooling rate of about 0.01°–0.2°C per minute, (4) seeding the molten mass with crystals of the intermolecular compound and (5) allowing the mass to stand until a crystal block of the intermolecular compound is obtained.

3,919,223

METHOD OF PRODUCTION OF QUINOXALINE, OBTAINED PARTICULARLY FROM NOT PURIFIED RAW MATERIALS

Andrzej Żmojdzin, and Bogustaw Hoffman, both of Poznan, Poland, assignors to Chemiczna Spoldzielnia pracy "Synteza", Poznan, Poland

Filed May 29, 1973, Ser. No. 364,404

Claims priority, application Poland, June 8, 1972, 155864; May 26, 1972, 156675

Int. Cl.² C07D *241/36*

U.S. Cl. 260—250 Q **12 Claims**

1. A method for the preparation of quinoxaline consisting essentially of reacting glyoxal and o-phenylenediamine in aqueous solution in a concentration of at least 6 weight % of glyoxal and 11 weight % o-phenylenediamine in the presence of at least one soluble alkali metal salt selected from the group consisting of alkali metal carbonates, nitrates, acetates and formates in an amount sufficient to cause the formed quinoxaline to become insoluble in the reaction mixture but not enough to cause precipitation of the alkali metal salt upon cooling of the reaction mixture.

3,919,224

ANTIBACTERIAL ACYLAMINOQUINOXALINECARBOXAMIDE 1,4-DIOXIDES

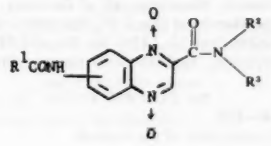
James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,132

Int. Cl.² C07D *241/52*

U.S. Cl. 260—250 QN **6 Claims**

1. A compound of formula:



wherein

R^1CONH is a substituent at the 6 or the 7 position;

R^1 is alkyl having from one to three carbon atoms;

and R^2 and R^3 are each selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms.

3,919,225

PREPARATION OF N-VINYL SUBSTITUTED AMIDINES

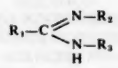
Robert J. Arnold, Evanston, and Marion J. Gattuso, Hoffman Estates, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 26, 1974, Ser. No. 464,583

Int. Cl.² C07D *239/00*

U.S. Cl. 260—251 R **10 Claims**

1. A process for the preparation of an N-vinyl substituted amidine which comprises reacting an amidine having the formula:



in which R_1 is selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl radicals and R_2 and R_3 are hydrogen, alkyl, alkenyl, cycloalkyl, aryl or together comprise an alkylene radical of from 2 to about 6 carbon atoms with a vinyl ether of the formula:

in which R_4 is alkyl of from 1 to about 6 carbon atoms or aryl, in the presence of a catalyst comprising a mercury compound selected from the group consisting of mercuric oxide, formate, acetate, propionate, butyrate and pentanoate and an acid selected from the group consisting of hydrochloric acid, nitric acid, sulfuric acid, phosphoric acid, methanesulfonic acid, ethanesulfonic acid, benzenesulfonic acid and p-toluenesulfonic acid, at a temperature of from about 50° to about 250°C. and a pressure of from about atmospheric to about 100 atmospheres, and recovering the resultant N-vinyl substituted amidine.

3,919,226

CERTAIN 6-PIPERAZINOALKYLAMINOPURINES

Max Thiel, Mannheim; Walter-Gunar Friebe, Darmstadt; Kurt Stach, Mannheim; Egon Roesch, Mannheim, and Androniki Roesch, Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

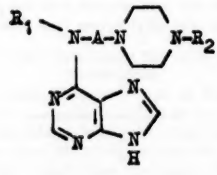
Filed June 12, 1974, Ser. No. 478,799

Claims priority, application Germany, July 4, 1973, 2334009

Int. Cl.² C07D *473/32*

U.S. Cl. 260—252 **15 Claims**

1. Purine compound of the formula



(I)

wherein

R_1 is hydrogen or lower alkyl;

R_2 is phenyl, benzyl, mono substituted phenyl or mono substituted benzyl wherein the substituent is selected from halogen, lower alkyl and lower alkoxy; and

A is lower alkylene or hydroxyloweralkylene.

3,919,227

COPOLYMERS OR CYCLOPROPENES WITH POLYMERIZABLE ETHYLENIC COMPOUNDS

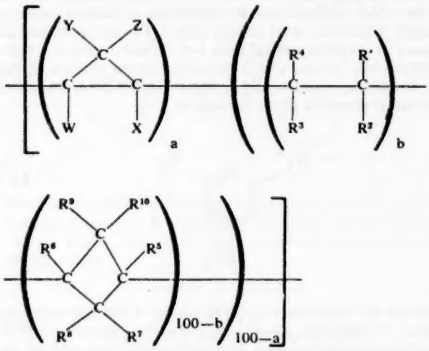
Sam Andreades, and Richard L. Baird, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 832,841, June 12, 1969, abandoned. This application Oct. 2, 1970, Ser. No. 77,724

Int. Cl.² C08F *5/00, 15/02, 15/04*

U.S. Cl. 260—85.5 R **19 Claims**

1. A copolymer of the formula



wherein:

a is the mole percent of cyclopropane units in the copolymer, being any number, including decimal fractions, between 1 and 99;

b is the mole percent of ethane units in the copolymer, being any number from 0 to 100 inclusive;

W, X, Y and Z which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1–18 carbon atoms, substituted alkyl in which the substituents may be hydroxy or lower alkoxycarbonyl, lower alkoxy, phenyl, substituted phenyl in which the substituents may be fluorine, chlorine, lower alkoxy or nitro, formyl, acetyl, carboxy, lower alkoxycarbonyl, cyano, carbamoyl and N,N-di(loweralkyl) carbamoyl; with the proviso that Y and Z may also be perfluoroalkyl of up to 6 carbon atoms when W is hydrogen and X is cyano;

R^1 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkenyl, phenyl, lower alkoxy, lower alkylcarbonyl, carboxy, lower alkoxycarbonyl, lower alkylcarbonyloxy, cyano, carbamoyl and N,N-di(-loweralkyl)-carbamoyl;

R^2 is selected from the group consisting of hydrogen, halogen, lower alkyl, vinyl, halovinyl, loweralkylvinyl, cyano, methylpyridinyl and phenylene sodium sulfonate;

R^3 is selected from the group consisting of hydrogen, halogen, carboxy and lower alkoxycarbonyl; and

R^4 is selected from the group consisting of hydrogen and halogen;

all of the foregoing with the proviso that R^2 and R^3 taken together may be an alkylene group of 2 to 6 carbon atoms;

R^5 and R^6 each are selected from the group consisting of hydrogen, halogen, hydroxyloweralkyl, hydroxyphenyl, loweralkoxyloweralkyl, loweralkoxyphenyl, halologeralkyl, halophenyl, -COOH, -COOR, -COSR, -COOM, -$CONH_2$, -CONHR, -$CONR_2$, -SO_2R, -CHO, -COR, -OCOR, -OR, -NO_2, -CN and -R, wherein M is one equivalent of a metal cation and R is hydrocarbyl of up to 18 carbons free of ethylenic and acetylenic carbon-to-carbon unsaturation; and

R^7, R^8, R^9 and R^{10} are each selected from the group consisting of hydroxy, amino, -NR_2 and R^5.

3,919,228

HETEROCYCLIC ISOCYANATES CONTAINING TWO RING NITROGEN ATOMS

Ulrich von Gizycki; Günter Oertel, both of Cologne-Flittard; Guenther Beck, and Kurt Findeisen, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

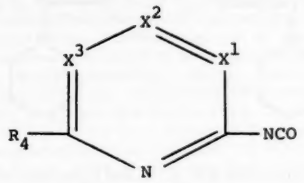
Division of Ser. No. 127,378, March 23, 1971. This application June 6, 1972, Ser. No. 260,088

Claims priority, application Germany, Mar. 26, 1970, 2014762

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 N 7 Claims

1. A heterocyclic isocyanate having only two ring nitrogen atoms and having the formula:



wherein

X^1 is nitrogen or $\geqslant C\text{-}R_1$,

where R_1 is chloro, a chloromethyl or a chloroethyl;

X^2 is $\geqslant C\text{-}R_2$,

wherein R_2 is chloro, a chloromethyl, or a chloroethyl;

X^3 is nitrogen or $\geqslant C\text{-}R_3$,

where R_3 is chloro, a chloromethyl or a chloroethyl; and

R_4 is chloro, a chloromethyl, a chloroethyl or phenyl.

3,919,229

PYRIMIDINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Gilbert Carraz, St. Jean de Moirans; Charles Pigerol, St. Ouen; Alain Jean-Grandremy, La Tronche, and Pierre Luc Eymard, Fontaine, all of France, assignors to Labaz, Paris, France

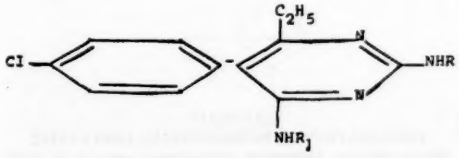
Filed July 18, 1973, Ser. No. 380,189

Claims priority, application United Kingdom, July 21, 1973, 34378/73

Int. Cl.² C07D *239/42*

U.S. Cl. 260—256.4 N 5 Claims

1. A pyrimidine compound of the formula:



or a pharmaceutically acceptable single (mono) and double (di) acid addition salt thereof, wherein R represents dipropylacetyl, tripropylacetyl, 2-ethyl-2-butylacetyl or 2-methyl-2-pentyl-acetyl and R_1 represents hydrogen or dipropylacetyl, tripropylacetyl, 2-ethyl-2-butyl-acetyl or 2-methyl-2-pentyl-acetyl.

3,919,230

β-NAPHTHYLMETHYL PIPERAZINYL DERIVATIVES

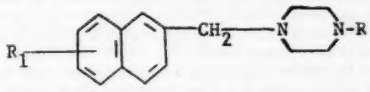
Harlan F. Hill, Narberth, and John J. Lafferty, Levittown, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 7, 1974, Ser. No. 440,431

Int. Cl.² C07D *239/24*

U.S. Cl. 260—256.4 N 7 Claims

1. A chemical compound of the formula



or a pharmaceutically acceptable acid addition salt thereof in which:

R is phenyl, pyridyl or pyrimidinyl; and

R_1 is hydrogen, lower alkyl having from one to five carbon atoms, halogen, hydroxy or lower alkoxy having from one to five carbon atoms.

3,919,231

SERIES OF 5-ARYL-2-FURAMIDINES

Stanford S. Pelosi, Jr.; Ronald E. White; Ralph L. White, Jr.; George C. Wright, and Chia-Nien You, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 278,618, June 17, 1974. This application Mar. 21, 1975, Ser. No. 560,869

Int. Cl.² C07D *239/26*, *307/54*

U.S. Cl. 260—256.4 R 1 Claim

1. The compound 5-(5-chloro-2-pyrimidinyl)-2-furamidine hydrochloride.

3,919,232

CHLORINATED BARBITURIC ACIDS

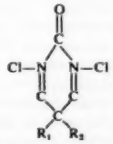
Sol J. Barer, 415 Cherry St., Elizabeth, N.J. 07208

Filed Mar. 26, 1974, Ser. No. 454,861

Int. Cl.² C07D *239/62*

U.S. Cl. 260—257 4 Claims

1. A compound having the formula:



where R_1 is chlorine and R_2 is alkyl of one to eight carbon atoms or chlorine.

3,919,233

CYCLIC UREA DERIVATIVES AND SALTS THEREOF

Rolf Rebling, Bielefeld; Klaus Pressler, Hoberge/Uerentrup, and Jurgen Potel, Gadderbaum, all of Germany, assignors to Asta-Werke Aktiengesellschaft Chemische Fabrik, Westfalen, Germany

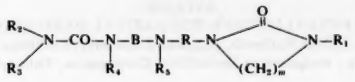
Filed Oct. 3, 1972, Ser. No. 294,623

Claims priority, application Germany, Oct. 9, 1971, 2150438

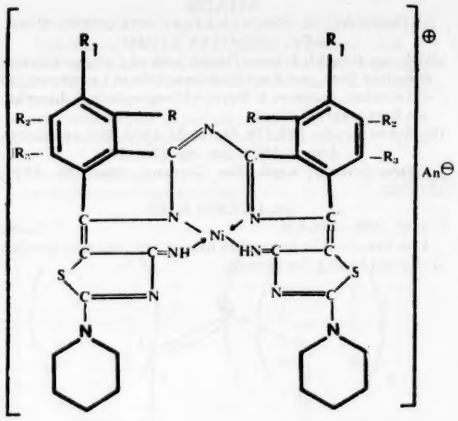
Int. Cl.² C07D *295/16*

U.S. Cl. 260—268 C 5 Claims

1. A compound having the formula



wherein *m* is 2 or 3, R is a member selected from the group consisting of the straight and branched alkylene groups having from 2 to 4 carbon atoms, R_1 is a member selected from the group consisting of the straight and branched alkyl and alkenyl groups having from 1 to 18 carbon atoms, R_2 and R_3, which may be identical or different from each other, represent members selected from the group consisting of hydrogen and the lower alkyl groups having from 1 to 4 carbon atoms and, R_2 and R_3 together represents a polymethylene chain having 5 or 6 carbon atoms, B is a polymethylene chain having from 2 to 3 carbon atoms and R_4 and R_5 are members selected from the group consisting of hydrogen and the lower alkyl groups having from 1 to 4 carbon atoms and R_4 and R_5 together represent a polymethylene chain having from 2 to 3 carbon atoms, and the salts of these compounds with pharmacologically acceptable acids.



in which zero to two of R, R_1, R_2 and R_3 are alkyl having 1 to 3 carbon atoms, alkoxy having 1 to 3 carbon atoms or phenyl, or are otherwise hydrogen; 0 to 4 of R, R_1, R_2 and R_3 are chlorine or are otherwise hydrogen; and An is a soluble colorless anion.

3,919,234

CERTAIN DIOXOPIPRAZINYL-ALKYL-PHENOLS

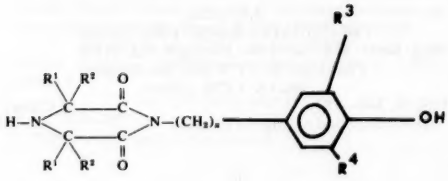
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 237,981, March 24, 1972, abandoned. This application July 12, 1973, Ser. No. 378,472

Int. Cl.² C07D *241/00*

U.S. Cl. 260—268 TR **7 Claims**

1. A compound of formula



wherein

R^1 and R^2 together with the carbon to which they are bound are cyclopentyl or cyclohexyl;

n is an integer of from 1 to 4; and

each of R^3 and R^4 is the same or different (lower) alkyl having from 1 to 4 carbon atoms, wherein at least one of said alkyls is branched on the α carbon atom.

3,919,235

POLYCYCLIC IMINOISOINDOLINE CHELATES

Nathan N. Crounse, and Nicholas A. Ambrosiano, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,163

Int. Cl.² C07D *417/14*

U.S. Cl. 260—270 PD **2 Claims**

1. A metal chelate pigment of the formula

3,919,236

PROCESS FOR THE PRODUCTION OF HYDROQUINOLINES

Theodor Volker; Klaus Hering, both of Fribourg, and Edouard Dallwigk, Visp, all of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 82,805, Oct. 21, 1970, abandoned. This application Feb. 7, 1973, Ser. No. 330,285

Claims priority, application Switzerland, Oct. 23, 1969, 15801/69

Int. Cl.² C07D *215/06*

U.S. Cl. 260—283 R **9 Claims**

1. A process for the production of tetrahydroquinoline compounds in which the corresponding quinoline compound is reacted with a carboxylic acid having from 1 to 4 carbon atoms or an anhydride thereof in the presence or absence of methyl or ethyl formate or acetate or a solvent at a temperature of from about 160° to 280° for from about 1 to 10 hours to produce a product mixture containing such compounds.

3,919,237

PREPARATION OF ISOMORPHINAN DERIVATIVE

Niklaus Halder, Fullinsdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

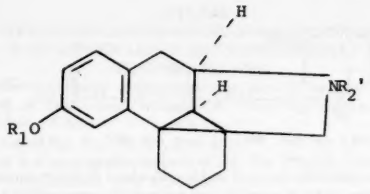
Filed July 3, 1973, Ser. No. 376,247

Claims priority, application Switzerland, July 7, 1972, 10202/72; May 21, 1973, 7121/73

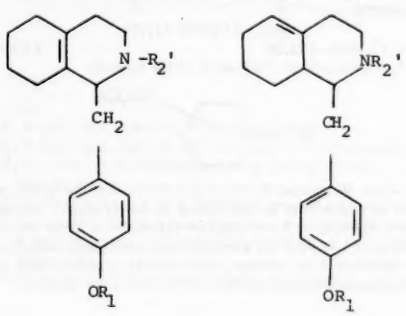
Int. Cl.² C07D *489/08*

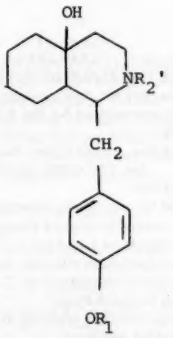
U.S. Cl. 260—285 **11 Claims**

1. A process for preparing an isomorphinan of the formula



wherein R_1 is selected from the group consisting of hydrogen, C_1 to C_8 lower alkyl, C_3 to C_8 cycloalkyl, C_3 to C_8 cycloalkyl—C_1 to C_8 lower alkyl, C_2 to C_8 lower alkenyl, propargyl, and the residue of both straight and branched chain carboxylic acid moieties of 2 to 7 carbon atoms and R_2' is an electron withdrawing group selected from the group consisting of lower alkanoyl, benzoyl, phenyl-lower alkanoyl, lower alkoxycarbonyl, phenoxycarbonyl, phenyl-lower alkoxycarbonyl, carbamoyl, C_1 to c_8 lower alkyl carbamoyl and C_1 to C_8 dilower alkyl carbamoyl wherein lower alkanoyl is the residue of both straight and branched chain carboxylic acid moieties of 2 to 7 carbon atoms, which consists essentially of the steps of cyclizing an isoquinoline represented by the formulae





wherein R_1 and R_2' are as described above using as the cyclization catalyst a mixture of boron trifluoride and a proton/hydronium ion donor said mixture containing no more than about 1 mole equivalent of proton donor or no more than about 2 mole equivalents of proton and hydronium ion donor per mole equivalent of boron trifluoride, and isolating the resulting cyclization product.

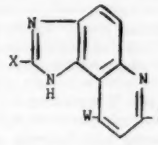
3,919,238

9-(SUBSTITUTED AMINO)IMIDAZO(4,5-F) QUINOLINES

Claude F. Spencer, and Harry R. Snyder, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 6, 1973, Ser. No. 367,501
Int. Cl.[2] C07D *215/38*
U.S. Cl. 260—288 CF **81 Claims**

1. A compound of the formula:



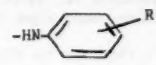
(I)

wherein

X is hydrogen, methyl, phenyl or hydroxy;

Z is methyl, ethyl, hydrogen or phenyl;

W is 2-piperidino-5-pyridylamino, 6-(4-methyl)-1-piperazinyl-3-pyridylamino, (4-methoxybenzyl)amino, 2-methoxy-5-pyridylamino, β-naphthylamino, cyclohexylamino, α-naphthylamino, anilino or



wherein R is 4-methyl, 2-chloro-5-methyl, 4-butyl, 3-chloro-4-methyl, 4-sec. butyl, 3-trifluoromethyl, 3-trifluoromethyl-4-chloro, 2-phenyl, 4-phenyl, 2-methyl-3-chloro, 4-isopropyl, 3,4-dichloro, 4-bromo, 4-iodo, 4-dimethylamino, 4-diethylamino, 3-chloro-4-dimethylamino, 4-piperidino, 4-(4-methylpiperazinyl), 3-dimethylamino, 3-chloro-4-piperidino, 3-chloro-4-(4-methyl)piperazinyl, 3-chloro-4-(4-benzylpiperazinyl), 4-methoxy, 4-ethoxy, 2-methoxy, 3-chloro-4-ethoxy, 4-butoxy, 3-methoxy, 4-phenoxy, 4-methylthio, 4-benzyloxy, 2-methylthio, 2-methylthio, 3,4-dimethoxy, 3,4-diethoxy, 3,4-diisopropoxy, 3,4-diisobutoxy, 3,4-dibutoxy, 3,4-disec. amyloxy, 2,5-diethoxy, 2,5-dimethoxy, 2,5-dimethoxy-4-chloro, 2-ethoxy-5-methoxy, 2-methoxy-5-ethoxy, 2,5-diethoxy-4-chloro, 2,4-dimethoxy-5-chloro, 3,4,5-trimethoxy, 2,4,5-triethoxy, 4-acetyl, 3-acetyl, 4-propionyl 4-butyryl, 2-methyl-4-chloro, 3-nitro-4-methyl, 3-chloro-4-ethyl, 3-chloro-4-butyl, 3-chloro-4-fluoro, 3-chloro-4-pyrrolidino, 2-methoxy-4-chloro, 3,4-methylenedioxy, 3,4-diamyloxy, 3,4-diisoamyloxy, 4-chloro-2,5-dibutoxy, or 4-(2-diethylamino)ethoxy with the proviso that X and Z are not simultaneously phenyl.

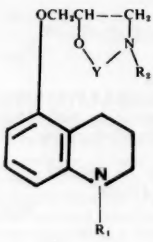
3,919,239

OXAZOLIDINE DERIVATIVES

Kazuyuki Nakagawa; Shiro Yoshizaki; Nanami Murakami; Hideo Mori, and Michiaki Tominaga, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 420,803
Claims priority, application Japan, Dec. 2, 1972, 47-120954; Dec. 2, 1972, 47-120955
Int. Cl.[2] C07D *215/20*
U.S. Cl. 260—288 CE **22 Claims**

1. Oxazolidine and oxazolidinone-(2) compounds represented by the formula (I):



(I)

wherein R_1 represents a hydrogen atom, a straight or branched chain alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms or a phenylalkyl group having 1 to 2 carbon atoms in the alkyl moiety thereof, R_2 represents a straight or branched chain alkyl group having 1 to 4 carbon atoms, and Y represents >C=O or >CH—R_3 wherein R_3 represents a hydrogen atom, a straight or branched chain alkyl group having 1 to 3 carbon atoms or a phenyl group.

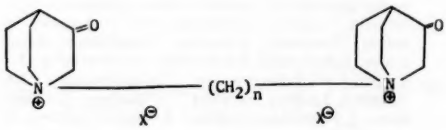
3,919,240

QUATERNARY QUINUCLIDINONES

Harold Z. Sommer, 719 Lewis St., Havre de Grace, Md. 21078, and Jacob I. Miller, 3401 Merle Drive, Baltimore, Md. 21207

Filed Aug. 17, 1966, Ser. No. 573,131
Int. Cl.² C07D *211/94*
U.S. Cl. 260—293.53 **6 Claims**

1. Compounds having the formula:



where *n* is 5 to 16 and where X is one equivalent of a non-toxic monovalent or polyvalent anion selected from the group of anions consisting of halide, hydrogen sulfate, hydrogen oxalate, nitrate, and perchlorate.

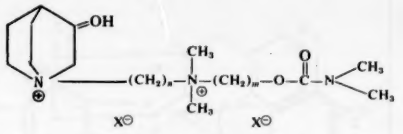
3,919,241

HYDROXYQUINUCLIDINE DERIVATIVES

Harold Z. Sommer, Havre de Grace, and Jacob I. Miller, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1966, Ser. No. 574,497
Int. Cl.² C07D *211/94*
U.S. Cl. 260—293.53 **3 Claims**

1. New chemical incapacitating agents, the compounds having the formula:



where *m* is 2 to 6, *n* is 6 to 16, and where X is one equivalent of a non-toxic monovalent or polyvalent anion selected from the group of anions consisting of halide, hydrogen sulfate, nitrate, hydrogen oxalate, perchlorate, and tetraphenylboronate.

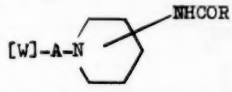
3,919,242

1-(BENZODIOXANYLALKYL)PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 323,684, Jan. 15, 1973, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,006
Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70
Int. Cl.² C07D *211/58*
U.S. Cl. 260—293.58 **2 Claims**

1. A heterocyclic compound of the formula



(I)

in which W represents benzo-1,4-dioxan-2-yl the benzo portion of which may be substituted by lower alkoxy, halogen, nitro, hydroxy or lower alkyl, A represents a lower alkylene radical of 1 to 4 carbon atoms, R represents phenyl which may be substituted by halogen, lower alkoxy or lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

3,919,243

SUBSTITUTED PIPERIDINIUM CHLORIDES

William R. Hydro, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1967, Ser. No. 687,392
Int. Cl.² C07D *405/02*
U.S. Cl. 260—293.67 **12 Claims**

1. In a method for producing substituted piperidines 1-[3-Oxo-3-(2-thienyl)propyl]-4-phenyl-4-propionoxypiperidinium chloride or 1-[3-Oxo-3-(2-furyl)propyl]-4-phenyl-4-propionoxypiperidium chloride comprising the steps of:
a. contacting 2-acetyl thiophene or 2-acetyl furan with dimethylamine and formaldehyde
d. contacting the product resulting from (a) above with an excess of methyl iodide
c. contacting the resulting product from (b) above with 4-phenyl-4-piperidium chloride
d. contacting the product resulting from (c) above with propionyl chloride followed anhydrous hydrochloric acid and recovering 1-[3-Oxo-3-(2-thienyl)propyl]-4-phenyl-4-propionoxypiperidium chloride or 1-[3-Oxo-3-(2-furyl)propyl]-4-phenyl-4-propionoxypiperidium chloride.

3,919,244

3H-OXAZOLO-[4,5-6]-PYRIDINE-2-ONE ESTER OF 3-(--) (-5-)-O-LOWER ALKYL AMINOPHOSPHATES AND THIOPHOSPHATES

Haukur Kristinsson, Bottmingen, and Kurt Rüfenacht, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 156,983, June 25, 1971, Pat. No. 3,808,218, which is a continuation-in-part of Ser. No. 155,604, June 22, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,343

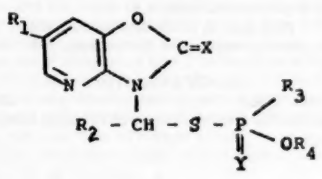
Claims priority, application Switzerland, June 26, 1970, 9702/70

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *213/65*

U.S. Cl. 260—294.8 C **2 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, chlorine, bromine or nitro,

R_2 is hydrogen, methyl, chloromethyl or bromomethyl,

R_3 is amino or dialkylamino having a total of from 2 to 4 carbon atoms,

R_4 is alkyl of from 1 to 4 carbon atoms, alkenyl of from 2 to 4 carbon atoms, alkoxyalkyl having a total of from 2 to 4 carbon atoms, or halogenalkyl of from 1 to 4 carbon atoms, and

each of X and Y represents oxygen or sulphur.

3,919,245

BENZENESULFONYL UREAS

Rudi Weyer, Frankfurt am Main; Walter Aumuller, Kelkheim, Taunus; Volker Hitzel, Lorsbach, Taunus, and Felix Helmut Schmidt, Mannheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

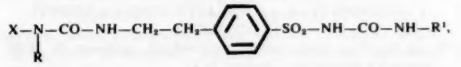
Filed Aug. 3, 1973, Ser. No. 385,323

Claims priority, application Germany, Aug. 7, 1972, 2238870

Int. Cl.² C07D *213/36*

U.S. Cl. 260—294.8 F **6 Claims**

1. A benzenesulfonyl-urea of the formula



in which X represents a pyridyl or a substituted pyridyl having one or two methyl groups which, in vicinal position to the nitrogen atom, is linked to the rest of the molecule, R is alkyl having 1 to 3 carbon atoms, R^1 is alkyl having 3 to 6 carbon atoms; cycloalkyl, alkylcycloalkyl, cycloalkylalkyl, cycloalkenyl, alkylcycloalkenyl having each 5 to 9 carbon atoms, cyclohexenylmethyl, chlorocyclohexyl, bicycloheptenylmethyl, bicycloheptylmethyl, bicycloheptenyl, bicycloheptyl, nortricyclyl, adamantyl, benzyl, or a salt thereof.

3,919,246

PROCESS FOR PREPARING 2-AMINO-1,4-DIHYDROPYRIDINE DERIVATES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

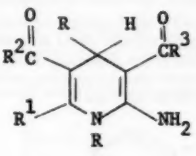
Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Oct. 17, 1974, Ser. No. 515,640

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.9 **35 Claims**

1. A process for the production of a compound of the formula:



wherein

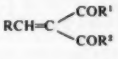
R is hydrogen; lower alkyl; lower alkenyl; lower alkynyl; phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio or phenyl; or naphthyl;

R^1 is hydrogen, lower alkyl, phenyl or pyridyl;

R^2 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino; and

R^3 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino,

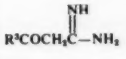
which comprises reacting a dicarbonyl compound of the formula:



wherein

R, R^1 and R^2 are as above defined,

with an amidine of the formula:



wherein

R^3 is as above defined,

at a temperature of from 20°C to 250°C and recovering the compound produced.

3,919,247

METHOD OF MANUFACTURING OF INDOLYL ACETIC ACIDS

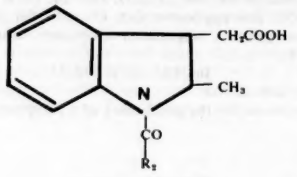
Ryszard Pakula; Jan Wojciechowski; Halina Poslinska; Lidia Pichnej, all of Warsaw; Leszek Ptaszynski, Lodz; Adam Przepalkowski, Lodz, and Roman Logwinieko, Lodz, all of Poland, assignors to Lodzkie, Zaklady Farmaceutyczne POLFA, Lodz, Poland

Continuation of Ser. No. 72,118, Sept. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 784,923, Sept. 18, 1968, abandoned. This application Apr. 17, 1974, Ser. No. 461,751

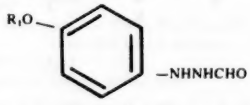
Int. Cl.² C07D *213/56*

U.S. Cl. 260—295 B 4 Claims

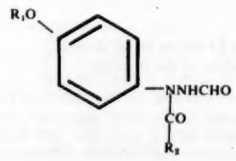
1. A method of manufacture of indolyl acetic acids of the formula



where R_1 is selected from the group consisting of a lower alkyl group containing 1–4 carbon atoms and benzyl, and R_2CO— is selected from the group consisting of benzoyl, halobenzoyl, nicotinoyl, and isonicotinoyl; consisting essentially of reacting phenylhydrazide of the formula



where R_1 has the above defined significance with a compound selected from the group consisting of an acid chloride of the formula R_2COCl and an acid anhydride of the formula $(R_2CO)_2O$, where R_2CO— has the above defined significance, wherein when said acid chloride is employed, the reaction is in the presence of a tertiary amine selected from the group consisting of pyridine and N,N-dimethylaniline at a temperature of about 0°C to about 60°C. or in the presence of an organic solvent selected from the group consisting of benzene, a lower alkyl benzene homologue tetrahydrofuran and chlorofuran at a temperature of about the boiling point of the reaction mixture until the time when the evolution of hydrogen chloride ceases, and when said acid anhydride is employed, the reaction is in the presence of an organic solvent selected from the group consisting of benzene, a lower benzene homologue, tetrahydrofuran and chloroform at the boiling point of the reaction mixture or direct in the absence of a solvent at a temperature of about 120°C to about 160°C; thereby forming an acylated phenylhydrazide of the formula



where R_1 and R_2 have the above defined significance; and reacting said acylated phenylhydrazide with levulinic acid in an anhydrous medium in the presence of gaseous hydrogen chloride at a temperature of about 10°C to about 100°C.

3,919,248

4-HYDROXY-5-AZACOUMARIN AND DERIVATIVES

Charles L. Lapiere, Tongeren; Jean V. Dejardin, Chenee, and Barbara R. Mania, Brussels, all of Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Filed Sept. 10, 1974, Ser. No. 504,787

Claims priority, application United Kingdom, Sept. 10, 1973, 42496/73

Int. Cl.² C07D *405/02*

U.S. Cl. 206—295 F 3 Claims

1. 3,3'-methylene-bis-(4-hydroxy-5-azacoumarin).

3,919,249

DIOXATRICYCLODECANOL, ESTERS THEREOF, AND PROCESS FOR THEIR MANUFACTURE

Robert Burns Woodward, Cambridge, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

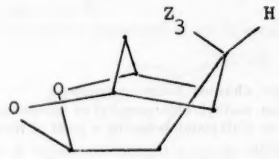
Filed Feb. 2, 1973, Ser. No. 329,254

Claims priority, application Switzerland, Feb. 10, 1972, 1946/72

Int. Cl.² C07D *319/08*

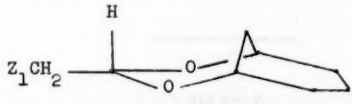
U.S. Cl. 260—340.7 20 Claims

1. A process for the manufacture of a racemic compound of the formula IV



(IV)

in which Z_3 represents a hydroxy group esterified with a member of the group consisting of an organic sulphonic acid, a lower alkylxanthogenic acid, and acetic acid wherein a compound of the formula III



(III)

in which Z_1 represents a hydroxy group esterified with methanesulfonic acid is hydrolytically cyclized in the presence of a base in water or in a mixture of water and a water-miscible solvent, and the compound obtained falling under the formula IV, wherein Z_3 represents a hydroxy group is esterified with a reactive derivative of an acid given above.

3,919,250

CATALYTIC REARRANGEMENT OF ACETYLENIC CARBINOIS TO A α,β-UNSATURATED CARBONYL COMPOUNDS

Horst Pauling, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

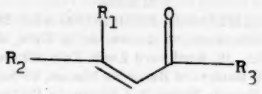
Filed Apr. 27, 1972, Ser. No. 248,046

Claims priority, application Switzerland, May 7, 1971, 6750/72; Mar. 10, 1972, 3564/72.

Int. Cl.² C07D *317/14*; C07C *47/26*, *47/20*, *49/44*

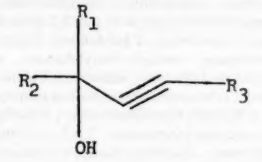
U.S. Cl. 260—340.9 23 Claims

1. In a process for obtaining alpha,beta-unsaturated carbonyl compounds of the formula:



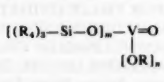
wherein R_1 is individually hydrogen or lower alkyl having from 1 to 7 carbon atoms; R_2 is individually straight chain saturated or olefinically unsaturated aliphatic hydrocarbyl, cyclohydrocarbyl or cyclohydrocarbyl substituted straight chain saturated or olefinically unsaturated aliphatic hydrocarbyl; R_1 taken together with R_2 form a cyclohydrocarbyl; R_3 is hydrogen, straight chain saturated or olefinically unsaturated aliphatic hydrocarbyl, cyclohydrocarbyl or cyclohydrocarbyl substituted straight chain saturated or olefinically unsaturated aliphatic hydrocarbyl; said aliphatic hydrocarbyl and cyclohydrocarbyl may be unsubstituted or substituted with from 1 to 3 lower alkyl groups having from 1 to 3 carbon atoms, and from zero to 1 substituents selected from the group consisting of lower alkoxy having from 1 to 7 carbon atoms, hydroxy, oxo, oxo ketalized with ethylene glycol, lower alkanoyl of from 2 to 6 carbon atoms, benzoyl, lower alkanoyloxy having from 2 to 6 carbon atoms, or benzoyloxy; wherein said aliphatic hydrocarbyl group has from 1 to 30 carbon atoms and said cyclohydrocarbyl group has from 4 to 20 carbon atoms;

by rearranging in an inert organic solvent medium an acetylenic carbinol of the formula:



wherein R_1, R_2 and R_3 are as above;

the improvement which comprises carrying out said rearrangement, in the presence of a catalyst of the formula:



wherein R_4 is lower alkyl, cyclohexyl, phenyl or phenyl lower alkyl, any of which may be substituted by lower alkyl; R is R_4 or $(R_4)_3Si$-; m is an integer of from 1 to 3; and n is 0, 1 or 2; with the proviso that the sum of m and n is 3; and the lower alkyl group has from 1 to 7 carbon atoms;

and at a temperature of from 22°C. to the boiling temperature of the reaction medium.

3,919,251

TRIHYDRIC ALCOHOL DERIVATIVES

Eirlys R. Isaac, Sittingbourne, and Michael D. Barker, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

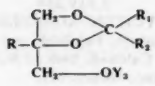
Continuation of Ser. No. 74,505, Sept. 22, 1970, abandoned. This application Aug. 28, 1973, Ser. No. 392,394

Claims priority, application United Kingdom, Sept. 23, 1969, 46745/69

Int. Cl.² C07D 317/22

U.S. Cl. 260—340.9 **9 Claims**

1. A compound of the formula



wherein R is an alkyl group of 1 to 6 carbon atoms; R_1 and R_2 each is hydrogen, a lower alkyl group, a lower alkyl group substituted by phenyl or a phenyl group optionally substituted by chlorine or by an alkyl group, or R_1 and R_2 together may be a polymethylene group of 3 to 6 carbon atoms; and Y_3 is a phenyl group, a chlorophenyl group, or benzyl optionally substituted on the ring by from 1 to 3 atoms of chlorine or fluorine or by a lower alkyl group or by a phenyl group.

3,919,252

2,6 DIHALOBENZYL ETHERS

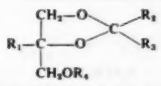
Michael D. Barker, Maidstone; Eirlys R. Isaac, Sittingbourne; Peter Kirby, Maidstone, and Graham C. Smith, Ramsgate, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed June 21, 1974, Ser. No. 481,723

Int. Cl.² C07D 317/16; A01N 9/28

U.S. Cl. 260—340.9 **6 Claims**

1. A 2,6-Dihalobenzyl ether having the following formula



I

wherein R_1 represents an alkyl group containing 1 to 6 carbon atoms; R_2 represents an alkyl group containing 1 to 6 carbon atoms, an aryl or aralkyl group up to 8 carbon atoms; R_3 represents a hydrogen atom or an alkyl group containing 1 to 6 carbon atoms or R_2 and R_3 together represent a polymethylene group of up to 6 carbon atoms and R_4 represents a 2,6-dihalobenzyl group.

3,919,253

PROSTAGLANDIN E_1 INTERMEDIATE, 2A-CARBOXY-3A-(1-HYDROXYETHYL)-5-OXOCYCLOPENTANEHEPTANOIC ACID,γ-LACTONE, LOWER ALKYL, AND ARALKYL ESTERS, AND PROCESSES OF THEIR PREPARATION

Chan-Hwa Kuo, South Plainfield; David Taub, Metuchen, and Norman L. Wendler, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 290,590, Sept. 20, 1972, Pat. No. 3,850,952. This application Oct. 15, 1973, Ser. No. 406,752

Int. Cl.² C07D 307/77

U.S. Cl. 260—343.3 **6 Claims**

1. 2α-Carboxy-3α-(1-hydroxyethyl)-5-oxocyclopentaneheptanoic acid loweralkyl or hydrocarbon(C_6-C_{10})aryl loweralkyl ester, γ-lactone.

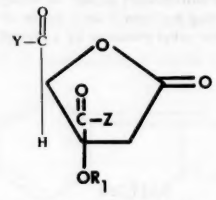
3. The process for the preparation of the compound of claim 1 which comprises heating 3-carboxymethyl-4-methyl-2-[1-carboxy-7-(loweralkoxy or aralkoxycarbonyl)heptyl]-4-hydroxybutyric acid, γ-lactone with a lower alkanoic acid anhydride and a base.

3,919,254
HYDROXYCITRIC ACID DERIVATIVES

Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 204,288, Dec. 2, 1971, Pat. No. 3,767,678. This application July 5, 1973, Ser. No. 376,478
Int. Cl.[2] C07D *307/32*
U.S. Cl. 260—343.6 9 Claims

1. A compound of the formula



wherein R_1 is lower alkanoyl having 1 to 8 carbon atoms; Y is OR_2'; Z is NR_5R_6; where R_2' is lower alkyl having 1 to 8 carbon atoms; R_5 and R_6 each taken independently is hydrogen, lower alkyl having 1 to 8 carbon atoms, phenyl or monocarboxy phenyl and the optical antipodes and pharmaceutically acceptable salts thereof.

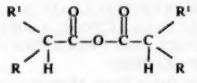
3,919,255
PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

Robert P. Allen, and Jerry D. Holmes, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,551
Int. Cl.[2] C07D *305/12*
U.S. Cl. 260—343.9 16 Claims

1. A process for producing a 2,2-disubstituted propiolactone having the formula:

which comprises the steps of reacting an isoanhydride having the formula:



wherein R and R^1 individually may be straight or branched chain alkyl, having 1 to 10 carbon atoms or phenyl, with formaldehyde or a formaldehyde yielding material at a temperature of from about 190°C. to about 400°C. in the presence of a catalyst consisting essentially of an inert support selected from the group consisting of a nondecrepitating silica gel and a calcined diatomaceous earth and a heteropoly acid having the formula:

$$X^n_aY_mO_m$$

where

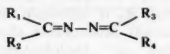
X^n (n is positive valence) = P^5, As^5, Si^4, Ge^4, Sn^4, Ti^4, Zr^4, Ce^4, or Th^4.
Y = W or Mo
m = 40 or 42
a = 8-n, i.e., a = 3 when n = 5, a = 4 when n = 4.

3,919,256
METHOD FOR PREPARING AZINES

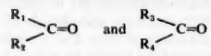
Jean-Pierre Schirmann, 4, avenue de la Gare, 69 Brignais; Pierre Tellier, 35, Boulevard Emile Zola, 69 Oullins; Henri Mathais, 31, Boulevard Baron du Marais, 69 Sainte Foy Les Lyon, and Francis Weiss, 3, Chemin du Perron, 69 Pierre Benite, all of France

Filed Mar. 13, 1973, Ser. No. 340,762
Claims priority, application France, Mar. 16, 1972, 72.09132
Int. Cl.[2] C07C *109/00*
U.S. Cl. 260—345.9 7 Claims

1. A method for the preparation of azines of the formula



which comprises reacting one or more cyanated compounds selected from the salts of hydrocyanic acid, cyanic acid and thiocyanic acid, halides and lower alkyl esters of cyanic acid, and the dimers and trimers of cyanic acid; with hydrogen peroxide and carbonyl compounds of the formula



wherein said carbonyl compounds are selected from formaldehyde, acetaldehyde, propionaldehyde, butyraldehyde, isobutyraldehyde, n-pentanal, pivaladehyde, oenanthal, 2-ehtylhexanal, 3-Δtetrahydrobenzaldehyde, hexahydrobenzaldehyde, 5-norbornene-2-carboxyladehyde, tetrahydropyran-2-carboxyaldehyde, benzaldehyde, the monochlorobenzaldehydes, p-nitrobenzaldehyde, anisaldehyde, β-chloropropionaldehyde, β-methoxyproprionaldehyde,4-cyano-2,2-dimethylbutraldehyde, acetone, 2-butanone, 2-pentanone, 3-pentanone, methylisopropyleketone, methylisobutyleketone, ethylamylketone, methylcyclohexylketone, acetophenone, benzophenone, cyclobutanone, cyclopentanone, cyclohexanone, 2-methylcyclohexanone, 3-methylcyclohexanone, 4-methylcyclohexanone, 2,4-dimethylcyclohexanone, 3,3,5-trimethylcyclohexanone, isophorone, cycloheptanone, cyclooctanone, cyclodecanone or cyclododecanone.

3,919,257
CATALYTIC VAPOR PHASE OXIDATION OF N-BUTENE TO MALEIC ANHYDRIDE USING TWO DIFFERENT CATALYSTS MAINTAINED IN TWO DISTINCT AND SEPARATE PORTIONS OF THE REACTION ZONE

Ernest C. Milberger, Solon; Serge R. Dolhyj, Parma, and Steven J. Miko, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 9, 1973, Ser. No. 331,088
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.8 4 Claims

1. The process for the preparation of maleic anhydride comprising contacting in an undivided reaction zone of a tubular reactor a mixture of n-butene and molecular oxygen with first catalyst of the formula

$$A_aB_bFe_cBi_dD_eMo_fO_x$$

wherein

A is an alkali metal, alkaline earth metal, rare earth metal, Nb, Ta, Tl or mixture thereof;
B is Ni, Co or mixture thereof;
D is P, As, Sb or mixture thereof;

and wherein

a is 0 to about 8;
b is 0 to about 12;
c and d are 0.1 to about 10;
e is 0 to about 3;
f is about 8 to about 16;
x is a number required to satisfy the valence requirements of the other elements present

to produce a product wherein at least part of the n-butene fed is converted to butadiene and then contacting in a subsequent zone of said tubular reactor said product with a second catalyst of the formula

$$A_aV_bFe_cSb_dMo_eO_x$$

wherein

A is a metal oxide, Te, P, As or mixture thereof;
a is 0 to about 3;
b and c are 0 to about 6;
d and e are 0.1 to 12;
$d + e$ is greater than $a + b + c$;
x is the number of oxygens to satisfy the valence requirements of the other elements present

wherein maleic anhydride is produced.

3,919,258

IMPROVED PROCESS FOR MAKING POLYMALEIC ANHYDRIDE

Norman Richardson, Middleton; Thomas Ivor Jones, Poynton, and Peter Miles, Stockport, all of England, assignors to Ciba-Geigy (UK) Limited, London, England

Filed Feb. 14, 1974, Ser. No. 442,548

Claims priority, application United Kingdom, Feb. 14, 1973, 7182/73; May 9, 1973, 22109/73

Int. Cl.² C07D *307/46*

U.S. Cl. 260—346.8 R **4 Claims**

1. An improved process for manufacturing polymaleic anhydride wherein maleic anhydride dissolved in a weight ratio of 1:1 to 1:3 in xylene solvent containing up to 99% orthoisomer is polymerized using di-tert-butyl peroxide polymerization catalyst, said catalyst being added to the reaction mixture over a period of up to 2.5 hours, wherein the improvement comprises

using 15 to 40% by weight of di-tert-butyl peroxide catalyst based on the maleic anhydride,

carrying out the polymerization at a temperature of 120° to 145°C, and

isolating at a temperature over 65°C essentially pure polymaleic anhydride as a light colored liquid immiscible in the xylene layer which contains unreacted maleic anhydride and reaction byproducts.

3,919,259

PREPARATION OF PHENYLMALEIC ANHYDRIDE

George D. Shier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1974, Ser. No. 453,469

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.8 **5 Claims**

1. In the process for making phenylmaleic anhydride by contacting a gaseous mixture of an aromatic hydrocarbon which is biphenyl or sec-butylbenzene and a molecular oxygen-containing gas with a vanadia catalyst at about 325°–450°C., the improvement wherein said mixture contains about 0.01–0.1 mole of a sulfur oxide per mole of aromatic hydrocarbon.

3,919,260

9-(2-TETRAHYDROFURYL)-2-NONENOIC ACID AND 9-(2-TETRAHYDROFURYL)-2,4-NONADIENOIC ACID AND ESTERS

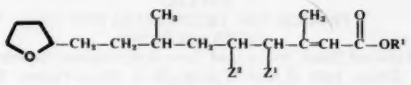
Karel Hejno; Karel Slama, and Frantisek Sorm, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 421,245, Dec. 3, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,843

Int. Cl.² C07D *307/28, 307/36*

U.S. Cl. 260—347.4 **6 Claims**

1. A compound selected from those of the following formula:



wherein,

each of Z^1 and Z^2 is hydrogen or Z^1 and Z^2 taken together form a carbon carbon bond; and

R^1 is hydrogen or alkyl group of one to five carbon atoms.

3,919,261

PREPARATION OF 2,5-DIMETHYLFURAN-3-CARBOXYLIC ESTERS

Hans Rupert Merkle, Ludwigshafen, and Hardo Siegel, Speyer, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

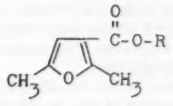
Filed Jan. 31, 1973, Ser. No. 328,480

Claims priority, application Germany, Feb. 16, 1972, 2207098

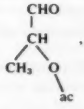
Int. Cl.² C07D *307/54*

U.S. Cl. 260—347.5 **6 Claims**

1. A process for the production of an alkyl ester of 2,5-dimethylfurancarboxylic acid of the formula



where R denotes lower alkyl, wherein an α-acyloxypropionaldehyde of the formula



where ac denotes acyl, is condensed in the presence of a catalytic amount of a base at a temperature of from −20° to +130°C with an acetoacetic ester of the formula

$$CH_3—CO—CH_2—CO—O—R,$$

where R has the above meanings, and the condensation product is cyclized at a temperature of from −20° to +130°C.

3,919,262

DIEPOXIDES OF 1,2-DIHYDROPHTHALATE

Steven A. Cerefice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to The Standard Oil Company, Chicago, Ill.

Division of Ser. No. 418,371, Nov. 23, 1973, Pat. No. 3,878,155. This application Aug. 29, 1974, Ser. No. 501,506

Int. Cl.² C07D *303/40*

U.S. Cl. 260—348 C **4 Claims**

1. A 1,2-dihydro-3,4;5,6-dioxyphthalate diester wherein the ester groups are selected from the class consisting of alkyl groups containing from 1 to 24 carbon atoms, aryl groups containing from 6 to 24 carbon atoms, aralkyl groups containing from 7 to 24 carbon atoms, vic-epoxyalkyl groups containing from 2 to 24 carbon atoms and mixtures thereof.

3,919,263
PROCESS FOR THE PREPARATION OF ANTHRAQUINONE

Raymond Janin, Irigny, and Leon Krumenacker, Serezin du Rhone, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 8, 1974, Ser. No. 468,139

Claims priority, application France, May 11, 1973, 73.17155

Int. Cl.² C07C *49/68*; C09B *1/06*

U.S. Cl. 260—385 **12 Claims**

1. In a process for the preparation of anthraquinone which comprises oxidising anthracene in the liquid phase by means of oxygen or an oxygen-containing gas, in an inert organic solvent and in the presence of a cupric salt, the improvement wherein the cupric salt is cupric bromide and the inert organic solvent is a saturated aliphatic alcohol or a compound of the general formula:

$$R_1O\text{-}\left[R'\text{-}O\right]_n R_2 \qquad (1)$$

in which R_1 and R_2, which may be identical or different, denote a hydrogen atom or a linear or branched alkyl radical containing up to 5 carbon atoms, R′ denotes a linear or branched alkylene radical containing up to 10 carbon atoms, and n is an integer from 1 to 3.

3,919,264
PROCESS FOR THE PRODUCTION OF ANTHRAQUINONE FROM DIHYDROANTHRACENE

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 264,703, June 21, 1972, abandoned, Continuation of Ser. No. 68,446, Aug. 31, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,481

Int. Cl.² C07C *49/68*; C09B *1/06*

U.S. Cl. 260—385 **4 Claims**

1. A process for the production of anthraquinone of high purity which comprises:

a. adding to a mixing zone at a temperature below reflux temperature:

i. a solution of dihydroanthracene having a purity of at least 90% in a solvent that is inert to nitric acid; and

ii. aqueous nitric acid having a concentration of 45 – 70% and wherein the nitric acid is in excess of the stoichiometric amount that is necessary to convert the dihydroanthracene to anthraquinone;

b. maintaining the resultant mixture under agitation and at a temperature of about the reflux temperature of said resultant mixture for a period of time sufficient to convert the dihydroanthracene to anthraquinone; and

c. cooling the mixture whereupon the anthraquinone becomes solids, and

d. thereafter separating the anthraquinone solids from the reaction mixture.

3,919,265
DIAMINOBENZOQUINONES, THE METHOD OF PRODUCING THE SAME AND HAIR DYE COMPOSITIONS CONTAINING THE SAME

Andree Bugaut, Boulogne-sur-Seine, and Monique Laudon, Gagny, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

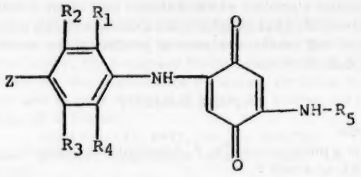
Filed June 18, 1973, Ser. No. 370,737

Claims priority, application Luxembourg, June 21, 1972, 065555; Jan. 23, 1973, 066883

Int. Cl.² C07C *87/48*, *87/62*

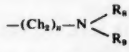
U.S. Cl. 260—396 R **5 Claims**

1. Diaminobenzoquinone selected from the group consisting of (1) a diaminobenzoquinone of the formula



wherein R_1, R_2, R_3 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy;

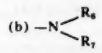
R_5 represents a member selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl and amino alkyl of the formula



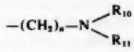
wherein n is 2-6 and R_8 and R_9 each independently represent a member selected from the group consisting of hydrogen, lower alkyl and hydroxy lower alkyl, and

Z is selected from the group consisting of

a. hydroxyl, and



wherein R_6 and R_7 each independently are selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, carbamyl lower alkyl, acetylamino lower alkyl, mesylamino lower alkyl, benzoylamino lower alkyl, and



wherein n is 2-6 and R_{10} and R_{11} each independently are selected from the group consisting of lower alkyl, hydroxy lower alkyl and acetylamino; and

2. a salt of the diaminobenzoquinone of (1) with a mineral or organic acid.

3,919,266
PRODUCTION OF BILE ACIDS

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Continuation-in-part of Ser. No. 290,910, Sept. 21, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,170

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.1 **18 Claims**

1. The method of producing substantially pure bile acids from natural animal bile, which comprises:

a. Substantially dehydrating the natural animal bile;

b. Esterifying the said dehydrated animal bile by treatment with a suitable esterification agent;

c. Subjecting the thus esterified animal bile to a multiphasic organic solvent system in one phase of which the bile acid fraction of said animal bile is soluble and the pigments and other impurities thereof are not soluble, and in the remaining phases of which, the said pigments and other impurities are soluble and the bile acid fraction is not soluble;

d. Separating and recovering the bile acid fraction of the animal bile;

e. Treating the said bile acid fraction with a suitable Group II*a* metal salt to obtain the corresponding Group II*a* metal bile acid salts;

f. Treating said bile acid salts with an organic solvent in which said bile acid salts possess differential solubility properties, to cause the separation of the desired bile acid salt;

g. Recovering said separated bile acid salt and subjecting

said salt to dissociation by treatment with a mineral acid; and

h. Recovering the desired free bile acid.

3,919,267
13β-ETHYL-17α-METHYL-18,19-DINOR-Δ⁴·⁹-PREGNADIENE-3,20-DIONE

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

Continuation-in-part of Ser. No. 119,903, March 1, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,380
Claims priority, application France, Mar. 3, 1970, 70.07551
Int. Cl.² A61K *31/56*
U.S. Cl. 260—397.3 **1 Claim**

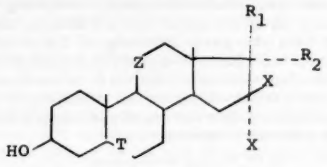
1. 13β-ethyl-17α-methyl-18,19-dinor-Δ⁴·⁹-pregnadiene-3,20-dione.

3,919,268
PROCESS FOR THE PREPARATION OF 3-AXIAL HYDROXY STEROIDS

Ajay K. Bose, 248 Morris Avenue, Mountain Lakes, N.J. 07046

Filed July 17, 1972, Ser. No. 272,231
Int. Cl.² C07J *9/00*
U.S. Cl. 260—397.4 **10 Claims**

1. A method of inverting the stereochemical orientation of the 3-hydroxy moiety of 3-equatorial hydroxy steroids which comprises reacting said 3-equatorial hydroxy steroid selected from the group of compounds of the formula:



wherein

T is a carbon-carbon single bond or carbon-carbon double bond, provided that where

T is a carbon-carbon single bond, the hydrogen at 5 is 5α

Z is $=CH_2$ or C = O

X is fluorine, chlorine or bromine

R_1 is hydroxy, alkanoyl, $R_3O—CH_2.C=O$

where R_3 is alkanoyl, aroyl, aralkanoyl, alkaroyl or hydroxy, lower alkyl, lower alkynyl, cyclo lower alkenyloxy, (lower alkoxy lower alkyl) lower alkoxy, (hydroxy lower alkyl) hydroxy lower alkyl, acetonidodihydroxy lower alkyl, R_2 is hydrogen, and R_2 and R_1 when taken together are = O, with triphenyl phosphone, diloweralkyl diazocarboxylate, and a member selected from the group consisting of alkyl, haloalkyl, polyhaloalkyl, aryl, alkaryl, and aralkyl carboxylic acids, phenols and halophenols,

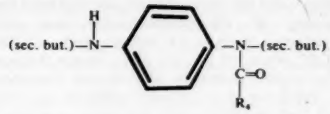
whereby there is formed a compound selected from the group consisting of the corresponding 3α-steroid esters and 3α-steroid phenyl ethers.

3,919,269
ACYLATED PHENYLENE DIAMINES

Fred Jaffe, Ossinging, N.Y., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 110,762, Jan. 28, 1971, abandoned. This application Dec. 17, 1971, Ser. No. 209,382
Int. Cl.² C07C *103/44*
U.S. Cl. 260—404.5 **5 Claims**

1. A mono-acylated phenylene diamine of the formula:



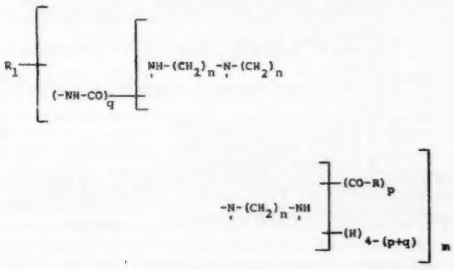
wherein sec. but. is a secondary butyl group and R_4 is C_1–C_{20} alkyl or phenyl.

3,919,270
POLYAMINE DERIVATIVES

Helmut Kirschnek, Leverkusen, and Hans Gorlich, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Feb. 9, 1973, Ser. No. 331,176
Claims priority, application Germany, Feb. 10, 1972, 2206302
Int. Cl.² C07C *103/30*
U.S. Cl. 260—404.5 **7 Claims**

1. Polyamine derivative of the formula



in which

R is C_{11}–C_{22}-alkyl;

R_1 is benzyl; xylylene; phenyl; phenylene, phenyl or phenylene substituted with C_1–C_4-alkyl or halogen; bis-phenylenemethane; 2,2-bis-phenylene propane; C_1–C_{18}-alkyl; C_1–C_{18}-alkyl substituted by halogen or C_1–C_4-alkoxy; C_4–C_8-alkylene; or cyclohexylene;

m is 1 or 2;

n is 2 or 3;

p has a value between 1.9 and 3.2, with the proviso that the sum $p + q$ has a value between 3 and 4; and the ratio of *p*:*q* is 1:0.25–0.6.

3,919,271
CATALYSIS BY DISPERSIONS OF METAL HALIDES IN MOLTEN TRIHALOSTANNATE (II) AND TRIHALOGERMANATE (II) SALTS

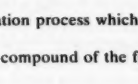
George W. Parshall, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 214,376, Dec. 30, 1971, Pat. No. 3,832,391, which is a division of Ser. No. 92,541, Nov. 24, 1970, Pat. No. 3,657,368, which is a continuation-in-part of Ser. No. 727,710, May 8, 1968, Pat. No. 3,565,823. This application June 10, 1974, Ser. No. 477,777
Int. Cl.² C11C *3/12*
U.S. Cl. 260—409 **3 Claims**

1. The hydrogenation process which comprises contacting

a. hydrogen and

b. an unsaturated compound of the formula



at least two and not more than three of R^5, R^6, R^7 and R^8 are hydrogen and the remainder are selected from the group consisting of alkoxycarbonylalkyl and alkoxycarbonylalkenyl of up to 14 carbons, and —COOR^9, and —COR^9, where R^9 is lower alkyl, except that when two are hydrogen, one may be alkyl of up to 12 carbons, with

c. a dispersion in an amount sufficient to catalytically effect hydrogenation, said dispersion consisting essentially of:

A. at least 0.05 weight percent of a chloride-, bromide- or iodide-containing salt of a metal having an atomic number of 26–28, 40–46, or 76–78; and

B. a molten salt of the formula

$$(R^1R^2R^3R^4Q)YX_3,$$

wherein

1. R^1, R^2, R^3, and R^4, independently, contain up to 18 carbons and are alkyl, cycloalkyl, aryl, alkaryl, or aralkyl; or
2. R^1 and R^2, conjointly, contains 4 to 6 carbons and is alkylene; or
3. R^1, R^2, R^3 and Q conjointly is pyridinium or quinolinium;
4. Q is nitrogen or phosphorus;
5. Y is tin or germanium; and
6. X is chlorine or bromine,

at a temperature between about 10° and 350°C. and above the melting point of the dispersion until said unsaturated compound is substantially hydrogenated.

3,919,272

PROCESS FOR PREPARING LINEAR FATTY ACIDS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Feb. 2, 1972, Ser. No. 223,014
Int. Cl.² C07C *51/14*, *67/38*
U.S. Cl. 260—410.9 R **4 Claims**

1. A catalytic process for preparing linear saturated fatty carboxylated products from alpha olefins having 3 to 40 carbon atoms by the process of heating a reaction mixture of:

a. said alpha olefins to be carboxylated,

b. at least a catalytic amount of $PdCl_2[As(C_6H_5)_3]_2$—$GeCl_2$ catalyst,

c. at least a stoichiometric quantity of an alkanol or water, said stoichiometry being based upon the concentration of alpha olefins present,

d. and at least a stoichiometric quantity of carbon monoxide, said stoichiometry being based on the alpha olefin content in said reaction mixture, until linear saturated fatty carboxylated products are prepared.

3. A catalytic process for preparing linear saturated fatty carboxylated products from alpha olefins having 3 to 40 carbon atoms by the process of heating a reaction mixture of:

a. said alpha olefins to be carboxylated,

b. at least a catalytic amount of $Pdcl_2[P(C_6H_5)_3]_2$—$GeCl_2$,

c. at least a stoichiometric quantity of an alkanol or water, said stoichiometry being based upon the concentration of alpha olefins present,

d. and at least a stoichiometric quantity of carbon monoxide, said stoichiometric quantity being based on the alpha olefin content in said reaction mixture, until linear, saturated, fatty carboxylated products are prepared.

3,919,273

NONAQUEOUS ACTINIDE HYDRIDE DISSOLUTION AND PRODUCTION OF ACTINIDE β-DIKETONATES

Larry R. Crisler, Arvada, Colo., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 23, 1974, Ser. No. 499,957
Int. Cl.² C07F *5/00*
U.S. Cl. 260—429.1 **9 Claims**

1. A nonaqueous method of dissolving actinide metal hydrides and forming anhydrous actinide metal β-diketonate complex molecular compounds comprising mixing an organic solvent selected from the group consisting of carbon tetrachloride, bromotrichloromethane, and trichloroacetonitrile, with an alcohol selected from the group consisting of ethanol, methanol and isopropanol to form a mixture, adding a β-diketone compound to said mixture, and thereafter contacting actinide metal hydride with said mixture to dissolve said hydride and form actinide metal β-diketonate complex molecular compound.

3,919,274

NONAQUEOUS METHOD FOR DISSOLVING LANTHANIDE AND ACTINIDE METALS

Larry R. Crisler, Arvada, Colo., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 23, 1974, Ser. No. 499,960
Int. Cl.² C07F *5/00*
U.S. Cl. 260—429.1 **10 Claims**

1. A method of dissolving elemental lanthanide and actinide metals and forming metal β-diketonate complex molecular compounds using nonaqueous reactants comprising contacting at least one of said metals with a β-diketone compound selected from the group consisting of 2,4-pentandione; 1,1,1,2,2,3,3-heptafluoro-7,7-dimethyl-4,6-octanedione; and 2-thenoyltrifluoroacetone in a mixture of carbon tetrachloride and methanol thereby dissolving said at least one of said elemental metals to yield a said one of said metals β-diketonate complex molecular compound.

3,919,275

CHELATED BETA DICARBONYL COMPOUNDS

Edward S. Rothman, North Hills, and Gordon G. Moore, Willow Grove, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 41,573, May 28, 1970, abandoned. This application Jan. 12, 1973, Ser. No. 323,021
Int. Cl.² C07F *1/08*
U.S. Cl. 260—438.1 **2 Claims**

1. The copper chelate of lauroylformylmethane.
2. The copper chelate of stearoylformylmethane.

3,919,276

METHOD OF PREPARING AMINES AND AMIDES

Gary E. Le Grow, and John L. Speier, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed July 31, 1974, Ser. No. 493,423
Int. Cl.² C07F *7/08*, *7/10*, *7/18*
U.S. Cl. 260—448.2 E **3 Claims**

1. A method comprising reacting a compound of the formula (1) $R_3SiNR'_2$ or $R_3SiNHO{=}CR'$ with a chloride of the formula (2) R''Cl at a temperature and pressure whereby compounds of the formula $R''NR'_2$ and $R''NHO{=}CR'$ respectively are obtained in which R and R' are alkyl groups and R'' is a hydrocarbon radical having no aliphatic carbon-carbon unsaturation beta to the chlorine or a silyl substituted hydrocarbon radical of the formula X_3SiQ— in which

X is alkyl, chlorine or alkoxy and

Q is a divalent hydrocarbon radical having no carbon-carbon aliphatic unsaturation beta to the chlorine and of

such size that the chlorine is at least 3 carbon atoms removed from the silicon.

3,919,277

MERCAPTOETHYLATION OF AMINES

Roberta R. Luhowy, Newton, and Frank A. Meneghini, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 343,284, March 21, 1973, abandoned. This application Aug. 21, 1973, Ser. No. 390,209

Int. Cl.[2] C07F *1/10*; **C07C** *149/24*

U.S. Cl. 260—430 **22 Claims**

1. A method which comprises reacting (a) an episulfide and (b) ammonia or an amine having at least one replaceable hydrogen atom in substantially equimolar proportions in solution containing silver salt at a temperature between 10° and 60°C. to form the silver complex of the corresponding β-mercaptoethylamine.

3,919,278

PRODUCTION OF ISOCYANATES FROM LOWER ALKYL ESTERS OF MONONUCLEAR AROMATIC CARBAMIC ACIDS

Rudolph Rosenthal, Broomall, and John G. Zajacek, Strafford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 13, 1974, Ser. No. 479,077

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **11 Claims**

1. A method for maximizing the production of isocyanates from lower alkyl esters of mononuclear aromatic carbamic acids having the general formula $R(NHCOOR')_x$ wherein R is a substituted or unsubstituted benzene ring, R′ is an alkyl radical having from 1 to 3 carbon atoms and x is 1 or 2, and R′ being the same or different when x is 2, by thermally decomposing the ester of said carbamic acid in a continuous process while said ester is dissolved in an inert solvent in which the total concentration of said ester and products produced therefrom by said decomposition is in the mole percent range of from about 1 to 20, said decomposition being at temperatures in the range of from 230° to 290°C. in the presence of an inert carrier agent at a mole ratio of inert carrier agent to ester of at least 3 to 1 to produce the isocyanate and corresponding alcohol as overhead products at concentrations in the vapor phase which minimize recombination of the isocyanate and alcohol.

3,919,279

CATALYTIC PRODUCTION OF ISOCYANATES FROM ESTERS OF CARBAMIC ACIDS

Rudolph Rosenthal, Broomall, and John G. Zajacek, Strafford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 26, 1974, Ser. No. 483,196

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **20 Claims**

1. A method for the production of isocyanates from esters of carbamic acids having the formula $R(NHCOOR')_x$ or $(RNHCOO)_xR'$ wherein R is a substituted or unsubstituted mono-, di- or trivalent organic radical selected from the group consisting of a saturated or mono-olefinic unsaturated straight or branched chain aliphatic or cycloaliphatic radical containing not more than 32 carbon atoms, an alkoxyalkyl radical having not more than 32 carbon atoms, an aryl radical, an aralkyl radical, and an alkaryl radical containing 1 to 5 rings; R′ is a substituted or unsubstituted mono-, di- or trivalent radical selected from the group consisting of a saturated or monoolefinic unsaturated straight or branched chain aliphatic or cycloaliphatic radical containing not more than 32 carbon atoms, an alkoxyalkyl radical having not more than 32 carbon atoms, an aryl radical, an aralkyl radical and an alkaryl radical containing 1 to 3 rings; and x is 1, 2 or 3, each R or R′ being the same or different, respectively where x is 2 or 3, which comprises thermally decomposing said ester at a temperature in the range of from 175°C. to 350°C. in the presence of a heavy metal or heavy metal compound catalyst while said ester is dissolved in an inert solvent to produce the isocyanate and alcohol, said solvent being characterized as a compound which is (a) solvent for said ester, (b) liquid and stable at said decomposition reaction temperature and (c) non-reactive with said isocyanate produced in said thermal decomposition reaction and is a compound or mixture of compounds selected from the group consisting of aliphatic, cycloaliphatic or aromatic hydrocarbons, substituted hydrocarbons, oxygenated compounds selected from the group consisting of ethers, ketones and esters and the sulfur analogues of said oxygenated compounds and separately recovering the isocyanate and alcohol.

3,919,280

RECOVERY OF SOLVENTS EMPLOYED IN THE PRODUCTION OF ISOCYANATES FROM ESTERS OF CARBAMIC ACIDS

Rudolph Rosenthal, Broomall; John G. Zajacek, Strafford, and James T. O'Toole, Philadelphia, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed July 5, 1974, Ser. No. 486,034

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **11 Claims**

1. In a method for the production of isocyanates from esters of carbamic acids by thermally decomposing said ester while said ester is dissolved in an inert reaction medium solvent to produce the isocyanate and corresponding alcohol, removing the isocyanate and alcohol as overhead in the vapor phase with a carrier agent and separately recovering the isocyanate and alcohol and carrier agent, leaving inert reaction medium solvent containing isocyanate and urethane values dissolved therein and by-product residue as bottoms, the improvement which comprises recovering said inert reaction medium solvent said solvent being a higher molecular weight compound or mixture of compounds selected from the group consisting of aliphatic, cycloaliphatic or aromatic hydrocarbons, substituted hydrocarbons, oxygenated compounds selected from the group consisting of ethers, ketones and esters and the sulfur analogues of said oxygenated compounds, together with isocyanate and urethane values contained therein by stripping said inert solvent and the isocyanate/ urethane values from the thermal reactor bottoms and the byproduct residue present in said reactor bottoms at temperatures in the range of 175°C. to 350°C. with an inert stripping agent selected from inert solvents, which are lower boiling inert compounds or mixture of compounds selected from the group consisting of aliphatic or aromatic hydrocarbons, substituted aromatic hydrocarbons, cycloaliphatic hydrocarbons, oxygenated compounds selected from the group consisting of ethers and ketones and the sulfur analogues of said oxygenated compounds, inert gases selected from the group consisting of nitrogen, helium, argon carbon dioxide, methane, ethane and propane and mixtures of solvents and gases.

3,919,281

PROCESS FOR PRODUCTION OF LIQUID CHLOROPRENE POLYMER

Kiyonobu Marubashi; Hideji Oshima, and Yasuaki Sakano, all of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

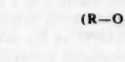
Filed May 16, 1974, Ser. No. 470,490

Claims priority, application Japan, May 17, 1973, 48-55090

Int. Cl.[2] C07C *154/02*

U.S. Cl. 260—455 B **16 Claims**

1. In a process for producing a liquid polymer by polymerizing chloroprene alone or in combination with one or more monomers copolymerizable with chloroprene in the presence of a xanthogen disulfide compound represented by the formula:



wherein R can contain 1 to 12 carbon atoms and is an alkyl group, an aryl group, an aralkyl group or a cycloaliphatic group, the improvement which comprises polymerizing said chloroprene in an organic solvent selected from the group consisting of (1) a solvent selected from the group consisting of an aromatic hydrocarbon, an aliphatic halogenated hydrocarbon and a cyclic ether having a boiling point of about 160°C or less at atmospheric pressure, and (2) carbon disulfide, said organic solvent being present in an amount of about 20 to 200 parts by weight per 100 parts by weight of total monomer, and said xanthogen disulfide compound being present in an amount substantially equal to a ratio of about 2.5 to 20 parts by weight of diethyl xanthogen disulfide to 100 parts by weight of total monomer, whereby a chloroprene based liquid polymer having xanthate active terminal groups substantially at the terminals thereof is obtained.

3,919,282

SUBSTITUTED O-(AMINOSULFONYL)-GLYCOLIC ANILIDES

Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim; Dietrich Mangold, Neckargemuend, and Wolfgang Rohr, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

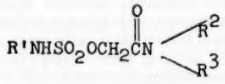
Continuation of Ser. No. 321,548, Jan. 5, 1973, Pat. No. 3,870,740. This application Sept. 3, 1974, Ser. No. 502,742

Claims priority, application Germany, Jan. 13, 1972, 2201432

Int. Cl.² C07C-*143/02*

U.S. Cl. 260—456 A **42 Claims**

1. A substituted 0-(aminosulfonyl)- glycolic anilide of the formula



where R′ denotes hydrogen or alkyl of one to six carbon atoms, R^2 denotes phenyl, and R^3 denotes alkyl of one to six carbon atoms.

3,919,283

SULFATE DERIVATIVES OF POLYGLYCOL COMPOUNDS

Alfred Berger, and Heinz Abel, both of Reinach, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

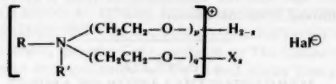
Continuation of Ser. No. 833,866, June 3, 1969, abandoned, which is a continuation of Ser. No. 533,774, March 14, 1966, abandoned. This application Aug. 14, 1973, Ser. No. 388,314

Claims priority, application Switzerland, Mar. 18, 1965, 3812/65; July 29, 1965, 10691/65

Int. Cl.² C07C *141/02*

U.S. Cl. 260—458 **6 Claims**

1. An amphoteric compound of the formula



wherein

R is a linear aliphatic hydrocarbon radical selected from the group consisting of alkyl and alkenyl radicals with 12 to 24 carbon atoms,

X is a radical selected from the group consisting of monodeshydroxy polybasic oxygen acid radical of an at least dibasic oxygen acid selected from the group consisting of sulfuric acid and succinic-sulfonic acid and the alkali metal and ammonium salt of said monodeshydroxy oxygen acid radical,

R′ is $NH_2C(=O)CH_2$-, $HOCH_2CH_2$- or $HOCH_2CH(OH)CH_2$-

Hal^- is chloride or bromide

p, q, and s are whole numbers, s is 1 or 2, and the sum (p+q) is 4 to 12.

3,919,284

PROCESS FOR MAKING 2-CYANO-2-HYDROXYIMINOACETAMIDE SALTS

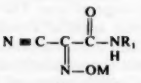
Kang Lin, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 13, 1974, Ser. No. 478,965

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.4 **7 Claims**

1. A process for preparing a 2-cyano-2-hydroxyiminoacetamide salt of the formula



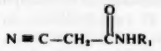
wherein

M is sodium, lithium, or potassium;

R_1 is hydrogen,

or

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or allyl, comprising contacting a nitrite of the formula MNO_2 with a 2-cyanoacetamide of the formula



in the presence of a proton donating acid and an aqueous solvent at a temperature of from 10° to 80°C, the mole ratio of 2-cyanoacetamide to nitrite being from 1:1 to 1:1.1, the mole ratio of nitrite to acid being from 1:0.1 to 1:0.5 and the aqueous solvent being from 5 to 100 percent by weight water and from 0 to 95 percent by weight water miscible organic solvent.

3,919,285
PGE$_3$ ANALOGS

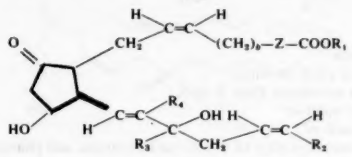
Udo F. Axen, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,987The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl.[2] C07C *69/74, 68/38*

U.S. Cl. 260—468 D **6 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein Z is ethylene substituted by one or 2 fluoro; wherein b is zero, one, 2, or 3; or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,919,286
PROSTAGLANDIN A$_2$ ANALOGS

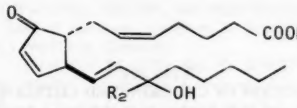
Gordon L. Bundy, and John E. Pike, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 288,848, Sept. 13, 1972, abandoned, which is a continuation of Ser. No. 72,105, Sept. 14, 1970, abandoned. This application May 1, 1974, Ser. No. 465,882

Int. Cl.[2] C02C *01/38;* **C07C** *09/74*

U.S. Cl. 260—468 D **7 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, or a pharmacologically acceptable cation, wherein R_2 is methyl or ethyl, and wherein the side-chain hydroxy is in S or R configuration.

3,919,287
19-HYDROXY-PGC COMPOUNDS

Robert L. Jones, Edinburgh, Scotland, assignor to The University Court of the University of Edinburgh, Edinburgh, Scotland

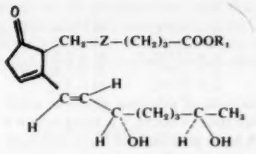
Division of Ser. No. 345,347, March 27, 1973, abandoned. This application June 26, 1974, Ser. No. 483,325

Claims priority, application United Kingdom, Mar. 28, 1972, 14520/72; May 17, 1972, 23135/72

Int. Cl.[2] C07C *61/38*

U.S. Cl. 260—468 D **9 Claims**

1. An optically active compound of the formula:



wherein Z is $-CH_2CH_2-$ or cis—CH=CH—, and wherein R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,919,288
METHOD FOR DISCONTINUOUS ESTER INTERCHANGE OF ESTERS OF DICARBOXYLIC ACIDS WITH ALIPHATIC DIOLS

Hans-Jochen Rothe, Offenbach, Main; John H. Oxley, Berlin, and Francois Terrier, Frankfurt am Main, all of Germany, assignors to Zimmer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 832,785, June 12, 1969, abandoned. This application Jan. 23, 1973, Ser. No. 326,028

Claims priority, application Germany, July 12, 1968, 1768923

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P **8 Claims**

1. A process for the discontinuous ester interchange of dimethyl terephthalate with aliphatic diols selected from ethylene glycol, propane diol, butane diol and mixtures thereof, which comprises:

charging said diol into a reactor which is provided with a means for heating the contents therein;

adding said dimethyl terephthalate to said diol at a predetermined rate which is represented by a quantity-time curve which lies within a first polygon formed by a plot of G as the ordinate and T as the abscissa, G being the fraction of total amount of dimethyl terephthalate to be added to the diol, T being the fraction of total feed time, said first polygon being formed by a line representing T = 0, a straight line passing through the two points (G = 0, T = 0) and (G =1, T = 0), and a curve represented by the equation:

$$G = 0.70 + 0.30\left(\frac{1 - e^{-2T}}{1 - e^{-2}}\right)$$

said dimethyl terephthalate being added to said diol in a total amount represented by a molar ratio M of the diol to dimethyl terephthalate, and said ester interchange reaction has an end temperature t_E which is not exceeded during the ester interchange reaction, said M and t_E are represented by a point within a second polygon formed by a plot with t_E as the ordinate and M as the abscissa, said second polygon being formed by straight lines connecting the following points seriatim:

$t_E = 205°C$, $M = 1.6$;
$t_E = 245°C$, $M = 1.2$;
$t_E = 275°C$, $M = 1.2$;
$t_E = 230°C$, $M = 1.8$; and
$t_E = 205°C$, $M = 1.8$;

said molar ratio of ethylene glycol to ester, M, as a function of total feed time in hours, T_E, lying within a figure defined by a plot with M as abscissa and T_E as ordinate, said figure being formed by a straight line passing through the two points ($M = 1.2$, $T_E = 1.5$) and ($M = 1.2$, $T_E = 6.0$); a curved line defined by the equation

$$T_E = \frac{1.2}{M-1.0}$$

passing through the two points ($M = 1.2$, $T_E = 6.0$) and ($M = 1.8$, $T_E = 1.5$); a straight line passing through the two points ($M = 1.8$, $T_E = 1.5$) and ($M = 1.8$, $T_E = 0.375$); and, a curved line defined by the equation

$$T_E = \frac{0.3}{M-1.0}$$

passing through the two points ($M = 1.8$, $T_E = 0.375$) and ($M = 1.2$, $T_E = 1.5$).

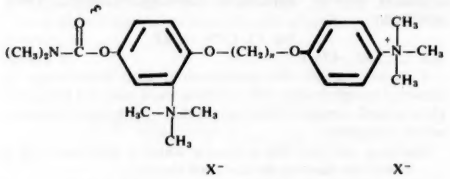
3,919,289

CARBAMATES

Harold Z. Sommer, Havre de Grace, Md., and John Krenzer, Chicago, Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1967, Ser. No. 638,695
Int. Cl.² C07C *125/00*
U.S. Cl. 260—479 C **2 Claims**

1. New chemical compounds having the generic formula:



wherein *n* is 2–8 methylene groups and X is one equivalent of an anion selected from the group of monovalent and polyvalent anions, said anions being selected from the group consisting of halide, hydrogen oxalate, perchlorate, nitrate, hydrogen sulfate, and tetraphenylboronate.

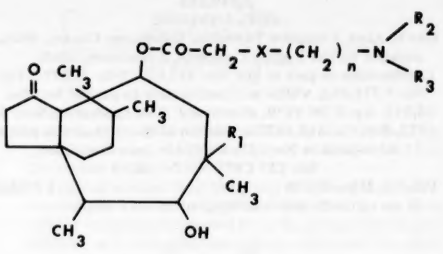
3,919,290

SUBSTITUTED 14-DESOXY-MUTILINS

Helmut Egger, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 294,642, Oct. 3, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,514
Claims priority, application Switzerland, Oct. 5, 1971, 14450/71; Oct. 5, 1971, 14451/71; May 25, 1972, 7740/72; May 25, 1972, 7738/72; May 25, 1972, 7739/72.
Int. Cl.² C07C *143/12*
U.S. Cl. 260—481 R **14 Claims**

1. A compound of the formula:



wherein
R_1 is ethyl or vinyl,
n is an integer from 2 to 5,
X is sulphur
and each of
R_2 and R_3 is alkyl of 1 to 10 carbon atoms, and pharmaceutically acceptable salts thereof.

3,919,291

N-ETHYLCARBAMINOMETHYLISOLEUCINE

Shigeshi Toyoshima; Seizo Kanao, both of Tokyo; Takeshi Toyoda, Sagamihara, and Tadashi Suyama, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 281,042, Aug. 16, 1972, Pat. No. 3,845,097, which is a continuation-in-part of Ser. No. 69,993, Sept. 4, 1970, Pat. No. 3,801,633. This application Mar. 14, 1974, Ser. No. 451,209
Claims priority, application Japan, Aug. 19, 1971, 46-63250; Aug. 19, 1971, 46-63252
Int. Cl.² C07C *101/26*
U.S. Cl. 260—482 C **1 Claim**

1. N-Ethylcarbaminomethylisoleucine.

3,919,292

PRODUCTION OF CHLORINATED COTELOMERS

David Vofsi, and Meir Asscher, both of Rehovot, Israel, assignors to Pechiney-Saint-Gobain, Courbevoie, France

Division of Ser. No. 812,296, April 1, 1969, Pat. No. 3,742,019. This application Mar. 9, 1973, Ser. No. 339,874
Int. Cl.² C07C *69/54*
U.S. Cl. 260—486 H **12 Claims**

1. A method for producing cotelomers comprising reacting a homogeneous solution comprising a mixture of a chloroolefin selected from the group consisting of vinyl chloride, vinylidene chloride and mixtures thereof and a non-chlorinated vinyl monomer selected from the group consisting of acrylic and methacrylic acids, their salts and alkyl esters, fumaric acid, maleic acid and maleic anhydride with a chloromethane selected from the group consisting of chloroform, carbon tetrachloride and mixtures thereof, with the mole ratio of the chloromethane to the total of the chloroolefin and the vinyl monomer being in the range of 1:1 to 1:10, in the presence of a catalyst selected from the group consisting of ferrous and ferric compounds, with the catalyst being present in an amount within the range of 0.05 to 10 mole percent based on the total of the chloroolefin and the vinyl monomer.

3,919,293

PGE$_2$, 15-ACETATE, METHYL ESTER

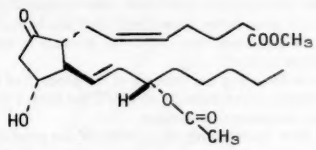
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, which is a continuation-in-part of Ser. No. 71,390, Sept. 11, 1970, abandoned. This application Oct. 25, 1973, Ser. No. 403,088

Int. Cl.^{2} C07C *69/74*

U.S. Cl. 260—488 R 1 Claim

1. A compound of the formula:



said compound being essentially free of the other components of colonies of the subclass Octocorallia.

3,919,294

PROCESS FOR PREPARING DIACETOXY BUTANE

Takeru Onoda, Yokohama; Akihisa Ohno, Kawasaki, and Ken Shiraga, Kurashiki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,334

Claims priority, application Japan, Sept. 11, 1972, 47-91611

Int. Cl.^{2} C07C *67/28*

U.S. Cl. 260—491 7 Claims

1. A process for preparing 1,4-diacetoxy butane, which comprises:

catalytically hydrogenating 1,4-diacetoxy-2-butene in the liquid phase in the presence of a metal catalyst selected from the group consisting of nickel and zinc; nickel, zinc and vanadium; and nickel and vanadium, wherein the atomic ratio of the zinc and vanadium components based on nickel ranges from 0.01 to 1.0.

3,919,295

PREPARATION OF INORGANIC FLUORIDE-FREE PERFLUOROALKANE SULPHONATES

Manfred Wechsberg, Opladen, and Hans Niederprüm, Monheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 26, 1974, Ser. No. 454,875

Claims priority, application Germany, Apr. 16, 1973, 2319078

Int. Cl.^{2} C07C *129/00, 143/02*

U.S. Cl. 260—501.14 4 Claims

1. In the preparation of a fluoride-free salt of a perfluoroalkane sulphonic acid of the formula R_fSO_3H, in which R_f is a perfluoroalkane radical containing 1 to about 10 carbon atoms, wherein the corresponding perfluoroalkane sulphonyl fluoride is subjected to alkaline hydrolysis with a primary base whose cation is selected from the group consisting of sodium, potassium, lithium, ammonium, triethylammonium, and guanidinium, in water or aqueous methanol, ethanol, dimethylformamide, or dimethylsulphoxide to produce an inorganic fluoride along with the perfluoroalkane sulphonic acid, the improvement which comprises adding to the hydrolysis mixture at a temperature of about 0°C to 250°C a secondary base whose cation is selected from the group consisting of calcium, strontium, barium, magnesium and lead, whereby the insoluble fluoride precipitates out from the liquid medium having perfluoroalkane sulphonate dissolved therein, separating the precipitate from the liquid medium, and thereafter isolating the perfluoroalkane sulphonate from the liquid medium, the relative proportions of the primary base and the secondary base each being approximately equivalent to the amount of sulphonyl fluoride, the amount of the secondary base being equivalent to or slightly in excess of the amount of the primary base.

3,919,296

PRODUCTION OF 1-AMINOALKANE-1,1-DIPHOSPHONIC ACIDS USING NITRILES, PHOSPHOROUS ACID AND HYDROGEN HALIDE

Norbert Schindler, Monheim-Baumberg, and Walter Plöger, Hilden Rhineland, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

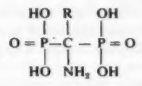
Continuation of Ser. No. 184,622, Sept. 28, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 442,080

Claims priority, application Germany, Oct. 6, 1970, 2048913

Int. Cl.^{2} C07F *9/38*

U.S. Cl. 260—502.5 6 Claims

1. In the process for the production of 1-aminoalkane-1,1-diphosphonic acids of the formula



in which R represents a member selected from the group consisting of alkyl with 1 to 12 carbon atoms, phenyl, carboxyalkyl with 2 to 12 carbon atoms, phenylalkyl with 7 to 12 carbon atoms, haloalkyl with 1 to 12 carbon atoms, nitroalkyl with 1 to 12 carbon atoms, cyclohexyl, and sulfonic acid alkyl with 1 to 12 carbon atoms, the steps comprising contacting a reactant mixture consisting essentially of (*a*) an organic nitrile of the formula R'—CN, in which R' represents a member selected from the group consisting of alkyl with 1 to 12 carbon atoms, haloalkyl with 1 to 12 carbon atoms, nitroalkyl with 1 to 12 carbon atoms, (carb-lower alkoxy)- alkyl with 3 to 17 carbon atoms, lower alkoxy-sulfonyl-alkyl with 3 to 16 carbon atoms, cyclohexyl, phenyl, phenylalkyl with 7 to 12 carbon atoms, and (*b*) phosphorous acid, with (*c*) a single hydrogen halide gas selected from the group consisting of hydrogen bromide gas and hydrogen iodide gas at 0° to 30°C, with said nitrile and said phosphorous acid being mixed together and present in the molar ratio of from 1:1.5 to 1:0.5 and from about 0.35 to 1 mole of said hydrogen halide gas being present per mole of said organic nitrile; conducting the reaction without external cooling; and recovering said 1-aminoalkane-1,1-diphosphonic acids.

3,919,297

N-(1,1-DI-PHOSPHONO ETHYL) ACETAMIDINE, PROCESS OF MAKING IT, AND METHOD OF USING IT FOR PREVENTING SCALE FORMATION

Friedrich Krueger, Edingen, and Walter Michel, Ilvesheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

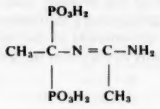
Filed Mar. 29, 1974, Ser. No. 456,366

Claims priority, application Germany, Apr. 2, 1973, 2316396

Int. Cl.^{2} C07F *9/38*

U.S. Cl. 260—502.5 1 Claim

1. N-(1,1-Di-phosphono ethyl) acetamidine of the formula



3,919,298

1,7-BIS(SULFONIC ACID)-M-CARBORANES

Robert N. Scott, Wallingford, and Haywood Hooks, Jr., West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 26, 1972, Ser. No. 292,359
Int. Cl. C07c *143/00*
U.S. Cl. 260—503 5 Claims

1. A 1,7-bis(sulfonic acid)-m-carborane of the formula:

$HO_3SCB_{10}H_{10}CSO_3H$.

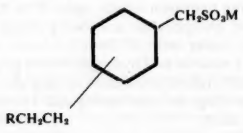
3,919,299

BIODEGRADABLE SULFONATE DETERGENTS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 277,837, Aug. 3, 1972, Pat. No. 3,867,432. This application Dec. 4, 1974, Ser. No. 529,318
Int. Cl.² C07C *143/00*
U.S. Cl. 260—503 6 Claims

1. A novel biodegradable detergent having the formula:



in which M is an alkali metal and R is an alkyl group of from 1 to about 14 carbon atoms.

3,919,300

DETERGENT COMPOSITION AND METHOD FOR PREPARING SAME

Masuzo Nagayama, and Hiroshi Okada, both of Tokyo, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 827,232, May 23, 1969, Pat. No. 3,769,332. This application July 18, 1973, Ser. No. 380,284
Claims priority, application Japan, May 25, 1968, 43-35339; Sept. 7, 1968, 43-64448
Int. Cl.² C07C *143/16*
U.S. Cl. 260—513 R 2 Claims

1. A method for preparing a sulfonated reaction product containing less than about 8% by weight of Δ^1-alkenesulfonate, based on the total amount of alkenesulfonates in the reaction product, which comprises:

1. flowing (A) a thin film of liquid α-olefin having from 10 to 25 carbon atoms through a reaction zone having a length of at least about 100 cm, and therein contacting said α-olefin with (B) a reactant gas containing from 1 to 10%, by volume, of SO_3 and the balance inert gas, the reactant gas being supplied at a rate in the range of from 0.9 to 1.25 moles of SO_3 per mole of α-olefin and the temperature of the reactant gas fed into the reaction zone being in the range of 30°C to 100°C, the pressure in the reaction zone being in the range of from 0.3 to 2 kg/cm² gauge, the α-olefin being present in the reaction zone for a time period in the range of from about 10 seconds to about 60 seconds, the sulfonation temperature in the reaction zone being maintained at a maximum temperature of not more than 85°C, to produce a sulfonation reaction product;
2. then maintaining the entirety of the product of step 1, at a temperature of from 20° to 100°C for from 1 to 5 hours, under anhydrous conditions;
3. and then neutralizing the entirety of the product of step 2 by adding thereto an aqueous solution of alkali in an amount of from about 0.6 to 1.0 moles equivalent based on the number of moles of SO_3 fed into the reaction zone, and
4. subjecting the entirety of the product of step 3 at a temperature from 130°C to 180°C for a period of from 5 minutes to 2 hours to hydrolyze the sultones contained in the product of step 3 whereby to produce a sulfonated reaction product comprised of alkenesulfonates and hydroxyalkanesulfonates, said sulfonated reaction product having a pH of from 7–14.

3,919,301

PERFLUOROALKYL SULPHINIC ACIDS AND A PROCESS FOR THEIR PRODUCTION

Herbert Walter Roesky, Frankfurt am Main; Hans Niederprum, Monheim, Rhineland, and Manfred Wechsberg, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 20, 1972, Ser. No. 290,680
Claims priority, application Germany, Sept. 29, 1971, 2148597
Int. Cl.² C07C *145/00*
U.S. Cl. 260—513.7 6 Claims

1. A process for the production of a perfluoroalkyl sulfinic acid of the formula R_fSO_2H, wherein R_f is a perfluorinated alkyl or cycloalkyl radical containing up to 12 carbon atoms, which comprises contacting a perfluoroalkyl sulfonyl fluoride of the formula R_fSO_2F with hydrazine at a temperature near or at reflux in the presence of a solvent selected from the group consisting of water, diethyl ether, tetrahydrofuran, dioxane, alkanols and chlorinated hydrocarbons to form the hydrazonium salt of the corresponding sulfinic acid and acidifying with a strong acid whereby there is formed the corresponding perfluoroalkyl sulfinic acid.

3,919,302

11,15 DIMETHYL-11 DEOXY $PGF_2\alpha$

Donald P. Strike, St. Davids; Wenling Kao, Devon, and Richard L. Fenichel, Wyncote, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,835
Int. Cl.² C07C *61/38*
U.S. Cl. 260—514 D 1 Claim

1. The compound which is 7-(5α-hydroxy-2β-[(3RS)-3-hydroxy-3-methyl-trans-1-octenyl]-3α-methyl-1α-cyclopentyl)-cis-5-heptenoic acid.

3,919,303
MANUFACTURE OF 3-AMINOBENZOYLBENZOIC ACIDS

Alfred Schuhmacher, Ludwigshafen; Heinrich Hiller, Wachenheim, and Joerg Redeker, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

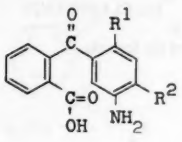
Filed Mar. 20, 1974, Ser. No. 453,151

Claims priority, application Germany, Mar. 22, 1973, 2314290

Int. Cl.² C07C *101/78*

U.S. Cl. 260—517 **10 Claims**

1. In a process for the manufacture of 3-amino-o-benzoyl-o-benzoic acid of the formula:



in which R^1 is hydrogen or chlorine and R^2 is hydrogen, chlorine, amino, methyl or hydroxyl, by the catalytic reduction of the corresponding 3-nitro compound, the improvement of reducing the aqueous alkali metal salt solution of the 3-nitrobenzoylbenzoic acid with hydrogen at atmospheric or slightly elevated pressures in the presence of boric acid, salts of boric acid or mixtures thereof and in the presence of Raney nickel, platinum or palladium.

3,919,304
β-HYDROXY-β-(CYCLOALKENYLPHENYL)ALKANOIC ACIDS, ESTERS AND SALTS

Alberto Rossi, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

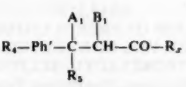
Continuation-in-part of Ser. No. 868,592, Oct. 22, 1969, abandoned. This application July 29, 1971, Ser. No. 167,507

Claims priority, application Switzerland, Oct. 25, 1968, 16004/68; May 23, 1969, 7965/69; Sept. 23, 1969, 14324/69

Int. Cl.² C07C *65/14*

U.S. Cl. 260—520 **5 Claims**

1. A compound of the formula



in which Ph′ represents meta-or para-phenylene or such phenylene substituted by trifluoromethyl, halogen or lower alkyl, A_1 is hydroxy, B_1 is lower alkyl or hydrogen, R_x is hydroxy or lower alkoxy and R_4 is 1-cycloalkenyl with 5, 6 or 7 carbon atoms or said 1-cycloalkenyl substituted by lower alkoxy or lower alkyl and R_5 is lower alkyl, or a therapeutically acceptable salt of the compounds with R_x being hydroxy.

3,919,305
PROCESS FOR THE PREPARATION OF PHENYLACETIC ACID

Michel Gay, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 164,424, July 20, 1971, abandoned. This application Sept. 5, 1973, Ser. No. 394,541

Claims priority, application France, July 21, 1970, 70.26829; June 2, 1971, 71.19979

Int. Cl.² C07C *51/26, 51/33*

U.S. Cl. 260—523 A **10 Claims**

1. A process for oxidising phenylacetaldehyde to phenylacetic acid with molecular oxygen or a gas containing molecular oxygen at 0° to 120°C. and a partial pressure of oxygen of 0.1 to 50 bars which comprises including in the reaction mixture a derivative of a metal selected from the group consisting of chromium, manganese, cobalt, iron and copper, the amount of the said metal in the mixture being between 0.0001 and 5% by weight.

3,919,306
PURIFICATION OF RECIRCULATED STREAM FOR ISOPHTHALIC ACID PRODUCTION

Carl E. Johnson, Blackwood, N.J., and Alan D. Baker, White Plains, N.Y., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 38,341, May 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 727,840, May 9, 1968, abandoned. This application June 5, 1972, Ser. No. 259,829

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 R **2 Claims**

1. In the method in which isophthalic acid is prepared in a reaction zone by the oxidation of meta xylene in a solvent containing a soluble cobalt catalyst, and in which method a stream of solvent containing dissolved catalyst is recirculated to the reaction zone after appropriate purification of the recirculated stream, the improvement which includes the steps of:

a. providing in the reaction zone acetic acid solvent and cobalt acetate catalyst and supplying to such reaction zone oxygen and meta xylene, said meta xylene containing a small amount of orthoxylene, oxidizing meta xylene to isophthalic acid and withdrawing a product stream comprising isophthalic acid, acetic acid, cobalt acetate, secondary products, contaminants comprising orthophthalic acid, organic acids, and other components;

b. separating isophthalic acid from said product stream to provide a depleted stream from which the isophthalic acid has been substantially completely depleted;

c. subjecting at least a portion of the depleted stream to flash distillation to strip therefrom a substantial portion of the acetic acid, water, and volatilizable components as an overhead stream and to provide a stream of stripped bottoms solution containing acetic acid, water, cobalt acetate, cobalt orthophthalate, orthophthalic acid, orher organic acids, and other components;

d. directing the stripped-bottoms stream to a precipitation zone for treatment for a period of about 0.5 hour or less at a temperature of at least about 75°C. with an aqueous solution containing about 5 weight per cent sodium carbonate, the final amount of sodium carbonate being at least 10% in excess of the stoichiometric amount necessary to react with all of the acid anions in the stripped bottoms solution to form a solution containing sodium acetate, sodium orthophthalate, other sodium salts, and other components, said solution containing a dispersion of a precipitate comprising cobalt carbonate, said precipitate being free from aromatic acids;

e. recovering the precipitate from the treated mixture by filtration to provide a filtrate containing all of the orthophthalic ion from the stripped bottoms solution and containing other components derived from the stripped bottoms solution;

f. washing the precipitate comprising cobalt carbonate with water to remove water soluble components comprising sodium salts;

g. transferring the washing precipitate to a catalyst regeneration zone in which the precipitate comprising cobalt carbonate is converted to catalytically active cobalt acetate by reaction of the precipitate with a stream of acetic acid, the thus prepared solution of cobalt acetate in acetic acid being completely free from catalytically poisonous quantities of orthophthalic acid;

h. preparing a solution of cobalt acetate in partially dried acetic acid suitable for recycling by removal of water from at least a portion of the depleted stream or streams derived from the depleted stream, said recycled solution

of partially dried acetic acid containing all of the cobalt acetate of step (g); and

i. charging the recirculated solution of catalytically active cobalt acetate in partially dried acetic acid to the reaction of step (a).

3,919,307
PROCESS FOR REACTING SOLID PARTICULATE MATTER WITH A GAS

Fred D. Barlow, Jr., and Joseph A. Moriarty, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,985
Int. Cl.² C07C *51/52*
U.S. Cl. 260—541 **2 Claims**

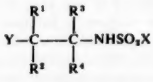
1. The method of producing sodium acetate or potassium acetate which comprises introducing dry particles of a basic alkali metal salt selected from the group consisting of sodium or potassium carbonate or bicarbonate and having an apparent bulk density of less than about 1.0 gram per cubic centimeter into a reaction zone, introducing vaporized acetic acid into said reaction zone in a manner which tends to give said basic alkali metal salt a buoyancy within said zone, allowing said basic alkali metal salt particles and said acid vapor to react at a temperature between about 120° and about 315°C. to thereby form sodium acetate or potassium acetate and to generate at least one gaseous reaction product which creates additional buoyancy for the particles, whereby a fluid bed of particles is at least partially maintained during the reaction by at least one gaseous reaction product of said basic alkali metal salt and acid, and removing the solid, particulate sodium acetate or potassium acetate and gaseous reaction product from the reaction zone.

3,919,308
BETA-HALOALKYLAMINOSULFONYL HALIDES AND THEIR PRODUCTION

Gerhard Hamprecht, Mannheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

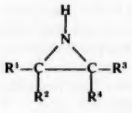
Filed Jan. 8, 1974, Ser. No. 431,702
Claims priority, application Germany, Jan. 11, 1973, 2301207
Int. Cl.² C07C *143/155*, *143/21*
U.S. Cl. 260—543 R **7 Claims**

1. A process for the production of a β-haloalkylaminosulfonyl halide of the formula:



(I)

in which the individual radicals R^1, R^2, R^3 and R^4 may be identical or different and each is hydrogen or an aliphatic, araliphatic or aromatic radical, moreover R^1 and R^3 and/or R^2 and R^4 together with the two adjacent carbon atoms may form an alicyclic ring; and X and Y are chloro or X is fluoro and Y is chloro or fluoro, which process comprises reacting an aziridine of the formula:



(II)

in which R^1, R^2, R^3 and R^4 have the said meanings, with a sulfuryl halide of the formula:

(III)

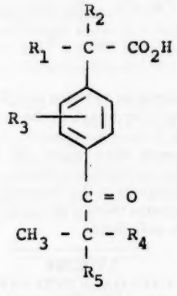
in which X and Y have the above meanings.

3,919,309
ACYL SUBSTITUTED PHENYL ALKANOIC ACIDS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 281,916, Aug. 18, 1972, abandoned. This application Mar. 19, 1973, Ser. No. 342,463
Int. Cl. C07C *65/20*
U.S. Cl. 260—515 R **17 Claims**

1. A compound of the formula



where

R_1 and R_2 each independently, represent hydrogen, or alkyl of 1 to 2 carbon atoms, and

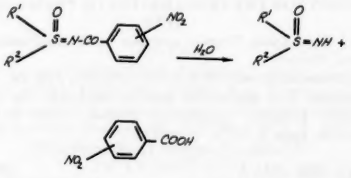
R_3 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy, and

R_4 and R_5 each independently, represent alkly having 1 or 2 carbon atoms or a pharmaceutically acceptable salt thereof.

3,919,310
PREPARATION OF FREE SULFOXIMINES BY HYDROLYSIS OF N-(ORTHO- AND PARA-NITROBENZOYL)-SULFOXIMINES

Wolfgang Dieter Herrmann, Denzlingen; Peter Johannes Stoss, Wildtal, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

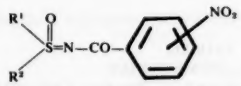
Division of Ser. No. 351,112, April 13, 1973, Pat. No. 3,868,418. This application Sept. 9, 1974, Ser. No. 504,013
Claims priority, application Germany, May 25, 1972, 2220256
Int. Cl.² C07C *145/00*
U.S. Cl. 260—551 S **1 Claim**



1. A process for the production of free sulfoximines of the general formula IV, and the acid addition salts thereof:

IV

wherein R^1 and R^2 represent an aliphatic radical having from 1 to 3 carbon atoms, a phenyl radical, or a para-methoxy phenyl radical, which comprises subjecting N-(ortho or paranitrobenzoyl)sulfoximines of the general formula I:



wherein R^1 and R^2 are as described above, to hydrolysis under either acid or alkaline conditions.

3,919,311

3A,12B-DIHYDRO-8H-DIBENZO[3,4,6,7]CYCLOHEPT[1,2-D]OXAZOL-8-ONES AND PROCESS FOR THEIR PREPARATION

Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

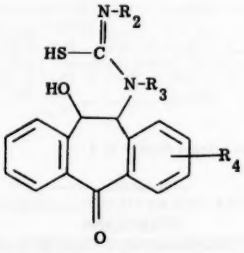
Division of Ser. No. 119,055, Feb. 25, 1971, Pat. No. 3,745,167, which is a division of Ser. No. 714,320, March 19, 1968, Pat. No. 3,625,942. This application Feb. 26, 1973, Ser. No. 336,132

Claims priority, application Switzerland, Mar. 26, 1967, 4246/67

Int. Cl.² C07C *157/14, 157/09*

U.S. Cl. 260—552 R **7 Claims**

1. A compound of the formula



wherein R_2 is selected from the group consisting of lower alkyl of 1 to 7 carbon atoms, lower alkenyl of 2 to 7 carbon atoms and lower cycloalkyl of 3 to 6 carbon atoms; R_3 is selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms and R_4 is hydrogen.

3,919,312

INTERMEDIATES FOR PREPARING ACRIDINES

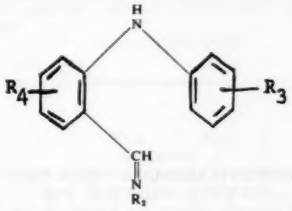
Elvin L. Anderson, Moorestown, N.J., and Harold Graboyes, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 267,852, June 30, 1972, Pat. No. 3,781,358, which is a division of Ser. No. 118,976, Feb. 25, 1971, Pat. No. 3,692,834, which is a continuation-in-part of Ser. No. 732,869, May 29, 1968, Pat. No. 3,625,945. This application Sept. 10, 1973, Ser. No. 395,483

Int. Cl.² C07C *133/02, 159/00*

U.S. Cl. 260—554 **2 Claims**

1. A compound of the formula:



in which:

R_3 and R_4 are hydrogen, halogen having an atomic weight of less than 80, lower alkyl, lower alkoxy, trifluoromethyl, trifluoromethylsulfonyl, dimethylsulfamoyl or lower alkylthio, at least one of R_3 and R_4 being hydrogen and R_2 is

or

3,919,313

NOVEL 1-N-(α-AMINOACETYL) AMINOADAMANTANES

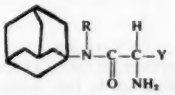
Frank J. Villani, West Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 381,849, July 23, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,834

Int. Cl.² C07C *103/28*

U.S. Cl. 260—558 A **8 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein R is a member of the group consisting of hydrogen, and lower alkyl of less than four carbon atoms, Y represents phenyl, benzyl and halophenyl.

3,919,314

CHEMICAL PROCESS

Richard John Marriott, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

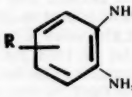
Filed Nov. 25, 1974, Ser. No. 526,922

Claims priority, application United Kingdom, Nov. 27, 1973, 54898/73

Int. Cl.² C07C *103/44*

U.S. Cl. 260—562 R **2 Claims**

1. A process for the monoacylation of an aromatic primary diamine having the formula:



wherein R represents hydrogen, halogen, lower alkyl or lower alkoxy which comprises reacting a mineral acid salt of the diamine with acetic anhydride or propionic anhydride in aqueous medium.

3,919,315

NEW AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

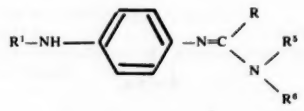
Division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Dec. 6, 1973, Ser. No. 422,258

Claims priority, application Germany, June 13, 1970, 2029299

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 RF **6 Claims**

1. A compound of the formula



wherein

R^1 is alkoxyalkyl of 2 to 5 carbon atoms;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms, or a salt thereof of a pharmaceutically acceptable acid.

3,919,316

2-AMINODICHLOROTETRALINS

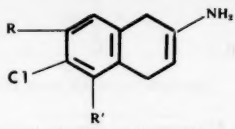
Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 5, 1974, Ser. No. 494,804

Int. Cl.² C07C *87/02*

U.S. Cl. 260—578 **4 Claims**

1. A compound of the formula



wherein one of R and R′ is hydrogen and the other is chlorine.

3,919,317

TETRAAZOMETHINES

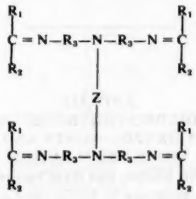
Ralph H. Huff, 4435 Woodleigh Lane, Pasadena, Calif. 91103, and Henry L. Lee, Jr., 745 Sierra Madre Blvd., San Marino, Calif. 91108

Filed Sept. 22, 1970, Ser. No. 74,495

Int. Cl.² C07C *119/00*

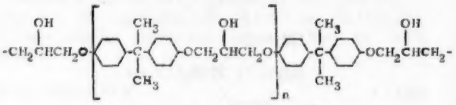
U.S. Cl. 260—566 R **2 Claims**

1. A tetraazomethine having the following formula



wherein R_1 is a lower alkyl group, R_2 is selected from the group consisting of R_1 and hydrogen, the radical

is derived from an aldehyde or ketones selected from the group consisting of methyl ethyl ketone, dimethyl ketone, diethyl ketone, methyl isobutyl ketone, dibutyl ketone, diisobutyl ketone, methyl isopropyl ketone, ethyl butyl ketone, acetaldehyde, propionaldehyde, butyraldehyde, and isobutyraldehyde and Z has the following structure:



wherein *n* is an integer from 0 to 4.

3,919,318

1,4-CYCLOHEXADIENE-1-CARBOXALDEHYDE SYN-OXIME SYNTHETIC SWEETENING AGENTS

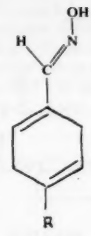
Edward M. Acton; Michael W. Lerom, and Herbert Stone, all of Menlo Park, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed June 10, 1974, Ser. No. 477,995

Int. Cl.² C07C *131/08*

U.S. Cl. 260—566 A **3 Claims**

1. An oxime compound having the formula



wherein R represents methoxymethyl or 1-methoxyethyl.

3,919,319
QUATERNARY AMMONIUM CHLORIDES

Karl Hintermeier; Otto Trosken, both of Frankfurt am Main, and Siegfried Wirth, Nieder-Rosbach, all of Germany, assignors to Cassella Farbewerke Mainkur Aktiengesellschaft, Germany

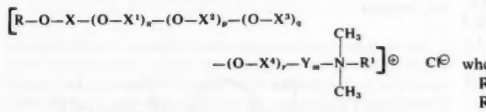
Filed Sept. 24, 1973, Ser. No. 399,699

Claims priority, application Germany, Oct. 13, 1972, 2250133

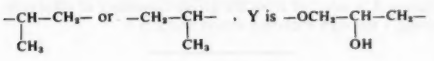
Int. Cl.[2] C07C *93/06*

U.S. Cl. 260—567.6 M **5 Claims**

1. A quaternary ammonium chloride of the formula



wherein R is alkyl having from 1 to 6 carbon atoms, R^1 is alkyl or alkenyl having 10 to 22 carbon atoms, X, X^1, X^2, X^3 and X^4 are $-CH-CH_2-$,



n, *p*, *q*, *r* and *m* are each zero or one and $n+p+q+r=a-m$ wherein *a* is 1, 2, 3 or 4.

3,919,320
HALOBERYLLIUM HYDRIDE-LEWIS BASE COMPLEXES

Jawad H. Murib; Stuart Schott, and Charles A. Bonecutter, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 316,532, Oct. 16, 1963, abandoned. This application Sept. 30, 1968, Ser. No. 763,969

Int. Cl. C07c *87/08, 87/62*

U.S. Cl. 260—583 R **10 Claims**

1. A haloberyllium hydride-Lewis base complex having the formula:

$$XBeH:Z_n$$

wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine, Z is a Lewis base which does not contain a protonic hydrogen and is a tertiary amine selected from the group consisting of trialkylamine wherein the alkyl group contains 1–3 carbon atoms, dialkyl phenyl amine wherein the alkyl group contains 1–3 carbon atoms, alkyl substituted pyridine wherein the alkyl group contains 2 or 3 carbon atoms and N-alkyl piperidine in which the alkyl group contains 1–3 carbon atoms, and n ranges between 0.5 and 2.0.

3,919,321
HALO-SUBSTITUTED-5H-DIBENZO[A,D]CYCLOHEPTEN-5-ONES

Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

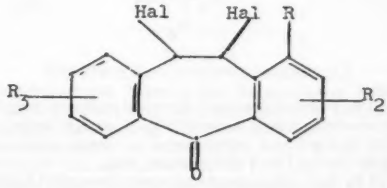
Division of Ser. No. 107,499, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 679,644, Nov. 1, 1967, abandoned. This application Mar. 8, 1974, Ser. No. 449,426

Claims priority, application Switzerland, Nov. 8, 1966, 16144/66

Int. Cl.[2] C07C *49/80*

U.S. Cl. 260—590 **3 Claims**

1. A compound of the formula



wherein

R is chlorine of fluorine,

R_2 and R_3 are hydrogen, chlorine or fluorine and

Hal is halogen.

3,919,322
3-SUBSTITUTED -5-ALKYL-2-CYCLOHEXEN-1-ONES

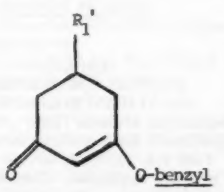
Arnold Brossi, Richen, Switzerland; Antonino Focella, and Sidney Teitel, both of Clifton, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 414,577, Nov. 9, 1973, abandoned, which is a division of Ser. No. 181,198, Sept. 16, 1971, Pat. No. 3,790,636, which is a division of Ser. No. 793,191, Jan. 22, 1969, abandoned. This application Sept. 23, 1974, Ser. No. 508,598

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 **1 Claim**

1. A compound of the formula



[Phenyl lower alkyl]

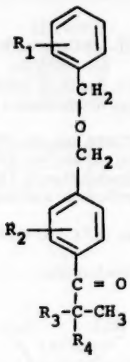
wherein R_1' is an alkyl group containing from 5 to 26 carbon atoms.

3,919,323
ACYL SUBSTITUTED DIBENZYLETHERS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 8, 1974, Ser. No. 495,863
Int. Cl.² C07C *49/76*
U.S. Cl. 260—592 4 Claims

1. A compound of the formula:



where

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, straight chain lower alkyl having 1 to 4 carbon atoms, or straight chain lower alkoxy having 1 to 4 carbon atoms, and

R_3 and R_4 each independently represent lower alkyl having 1 to 2 carbon atoms.

3,919,324
ALKAN-1-AL-7-OLS

Walter Himmele, Walldorf; Werner Hoffmann, Ludwigshafen; Heinrich Pasedach, Ludwigshafen, and Werner Aquila, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Claims priority, application Germany, Dec. 24, 1969, 962.8
Filed Dec. 17, 1970, Ser. No. 99,308
Int. Cl.² C07C *47/19*
U.S. Cl. 260—602 4 Claims

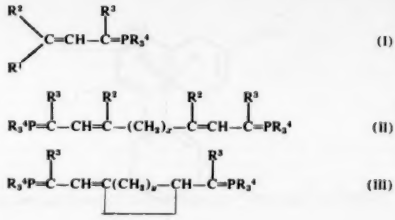
1. 3,4,7-trimethyloctan-1-al-7-ol.
2. 3,7-dimethylnonan-1-al-7-ol.
3. 3,7,8-trimethylnonan-1-al-7-ol.
4. 3-methyloctan-1-al-7-ol.

3,919,325
PROCESS FOR PREPARING ALLYLIDENPHOSPHORANES

Borislav Bogdanovic, Mulheim (Ruhr), Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim (Ruhr), Germany

Filed Feb. 26, 1973, Ser. No. 335,986
Claims priority, application Germany, Mar. 1, 1972, 2209685
Int. Cl. C07j *9/36*
U.S. Cl. 260—606.5 P 7 Claims

1. A process for preparing an allylidene phosphorane of the formula (I), (II) or (III)



(I)

(II)

(III)

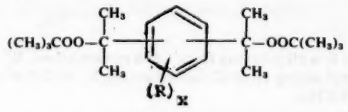
wherein R^1 and R^2 is each hydrogen or like or different alkyl of 1–20 carbon atoms or cycloalkyl groups of 5–12 carbon atoms, R^3 is hydrogen or alkyl of 1–20 carbon atoms, and R^4 is phenyl or tolyl, x is a value from 4 to 20, and y is 3 or 4, which comprises reacting the dialkyl aluminum alkylidene amide or bis (N-dialkyl aluminum-imino) alkane obtainable from saturated aliphatic nitrile or dinitrile and dialkyl aluminum hydride, with an alkylidene phosphorane $R^3CH{=}PR_3^4$.

3,919,326
POLYPEROXIDES

George P. Gregory, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 189,368, Oct. 14, 1971, abandoned, which is a division of Ser. No. 736,027, June 11, 1968, Pat. No. 3,658,914, which is a continuation-in-part of Ser. No. 137,744, Sept. 13, 1961, Pat. No. 3,402,205. This application Jan. 16, 1975, Ser. No. 541,481
Claims priority, application Canada, Sept. 13, 1962, 857867
Int. Cl.² C07C *179/00, 179/06*
U.S. Cl. 260—610 R 3 Claims

1. As a new composition of matter an organic peroxide of the formula



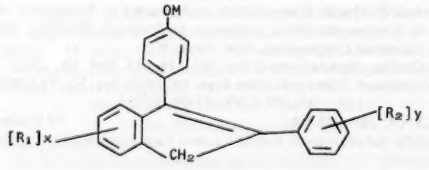
wherein R is selected from the group consisting of alkyl containing 1 through 4 carbon atoms and x is 1.

3,919,327
PHENOLIC DIPHENYLBENZOCYCLOALKENES

Daniel Lednicer, Portage Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 292,767, July 3, 1963, abandoned. This application June 18, 1973, Ser. No. 371,055
Int. Cl.² C07C *43/20*
U.S. Cl. 260—613 R 6 Claims

1. A compound of the formula:



wherein M is selected from the class consisting of hydrogen, sodium, and potassium, R_1 and R_2 are each selected from the class consisting of lower-alkyl, lower-alkenyl, lower-alkoxy, lower-alkenyloxy, halogen, trifluoromethyl, and lower-alkylmercapto, x and y are intergers from 1 to 4, inclusive; with the proviso that the sum of *x* and *y* is no more than 4.

3,919,328
PROCESS FOR THE PREPARATION OF SELECTIVELY HALOGENATED KETONES AND KETALS

Eddie N. Gutierrez, Fort Lee, and Robert C. Reardon, Jr., Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,855
Int. Cl.² L07C *43/00, 43/30*
U.S. Cl. 260—615 A **9 Claims**

1. A method for preparing selectively halogenated ketals which comprises treating with a halogen selected from the group consisting of chlorine and bromine ether compounds of the formula:

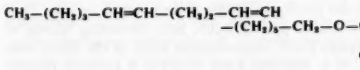
wherein R_1 is a straight chain unsubstituted alkyl group of from 1 to 20 carbon atoms, R_2 and R_3 are straight chain unsubstituted alkyl groups of from 1 to 10 carbon atoms; said treatment being in methanol wherein the ratio of said methanol to said ether is from about 5:1 to about 20:1 and at a temperature of from about 0°C to about 80°C.

3,919,329
SYNTHESIS OF THE PINK BOLLWORM SEX PHEROMONE

Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Apr. 25, 1974, Ser. No. 463,938
Int. Cl.² C07c *43/00;* **C07C** *43/30*
U.S. Cl. 260—615 A **1 Claim**

1. The compound of the formula



as a mixture of the cis-7,cis-11 and cis-7,trans-11 isomers.

3,919,330
PROCESS FOR THE PURIFICATION OF 2,2-BIS-(4-HYDROXYPHENYL)PROPANE

Arien Kwantes, and Bernhard Stouthamer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 3, 1974, Ser. No. 511,980
Claims priority, application United Kingdom, Nov. 2, 1973, 51006/73
Int. Cl.² C07C *37/22, 37/26*
U.S. Cl. 260—619 R **9 Claims**

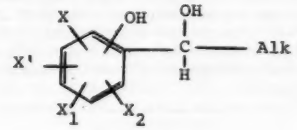
1. A process for the purification of a crude 2,2-bis(4-hydroxyphenyl)propane mixture prepared by reacting phenol with acetone or 2,2-dimethyl-1,3-dioxolane in the presence of an acidic catalyst, said crude 2,2-bis(4-hydroxyphenyl)propane mixture being free of phenol, which process comprises:
a. dissolving the crude 2,2-bis(4-hydroxyphenyl)propane and impurities in ethylene glycol;
b. contacting the ethylene glycol-crude 2,2-bis(4-hydroxyphenyl)-propane solution with water wherein the weight ratio of water to the ethylene glycol-crude 2,2-bis(4-hydroxyphenyl)propane solution is about 15:100 to about 40:100.
c. gradually cooling and agitating the ethylene glycol-crude 2,2-bis(4-hydroxyphenyl)propane-water solution so as to form a purified 2,2-bis(4-hydroxyphenyl)propane precipitate; and
d. recovering the purified 2,2-bis(4-hydroxyphenyl)propane.

3,919,331
MONOHYDROXYPHENYL CARBINOLS

Max Schellenbaum, Muttenz; Max Duennenberger, Frenkendorf, and Fulvio Casagrande, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 164,446, July 20, 1971, Pat. No. 3,879,477. This application Feb. 26, 1975, Ser. No. 553,333
Claims priority, application Switzerland, July 23, 1970, 11172/70
Int. Cl.² C07C *39/26*
U.S. Cl. 260—623 R **7 Claims**

1. A compound of the formula



wherein each of X and X′ is halogen; each of X_1 and X_2 is hydrogen or halogen; Alk is straight or branch chain alkyl having from 1 to 8 carbon atoms; and the hydroxy group is in the 2- or 4-position to the carbinol bridge.

3,919,332
PHENOL PROCESS

John C. Wollensak, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed June 25, 1973, Ser. No. 373,273
Int. Cl.² C07C *39/06*
U.S. Cl. 260—624 R **10 Claims**

1. A process for converting the amine group of a monoaminobenzene to a hydroxy group, said monoaminobenzene having at least one hydrogen atom bonded to the amino nitrogen atom and being selected from the group consisting of unsubstituted aminobenzene and aminobenzenes substituted with substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, halogen and alkoxy, said process comprising reacting said aminobenzene with water in the presence of a hydrogen transfer catalyst selected from the

group consisting of catalysts which contain a metal selected from the group consisting of platinum, palladium, ruthenium, rhodium, nickel, copper, chromium, molybdenum, vanadium and mixtures thereof, and a reaction propagating agent selected from the group consisting of cyclohexanones, cyclohexylimines and mixtures thereof at a temperature of about 200°–400°C.

3,919,333
ALKYLATION PROCESS

John C. Wollensak, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 12, 1974, Ser. No. 450,418
Int. Cl.² C07C *39/06, 39/27*
U.S. Cl. 260—624 R **24 Claims**

1. A process for alkylating the nucleus of a phenol, said process comprising reacting a primary alkanol containing from 2 to 30 carbon atoms with a phenol having an unsubstituted nuclear position ortho or para to the phenolic hydroxyl group, without adding aldehyde or copper, said phenol being selected from the group consisting of unsubstituted phenols and phenols substituted with hydrocarbon, halogen or alkoxy groups, in the presence of an alkali metal hydroxide at a temperature of 200°–300°C and obtaining as the product said phenol having a primary C_{2-30} alkyl group in said ortho or para position.

3,919,334
PROCESS FOR PREPARING PYROCATECHOL

Günther Klag, Leverkusen; Hermann Wunderlich, Odenthal; Gerhard Jung, Opladen, and Rolf Aumüller, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 24, 1973, Ser. No. 382,233
Claims priority, application Germany, Aug. 1, 1972, 2237750
Int. Cl.² C07C *37/02, 39/08*
U.S. Cl. 260—629 **8 Claims**

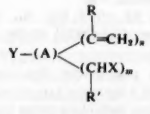
1. Process for preparing pyrocatechol which consists essentially of hydrolyzing o-chlorophenol with 2.0 to 2.9 mols of aqueous alkali liquor per mol of o-chlorophenol, under pressure of 15 to 45 atm, in the presence of metallic copper as catalyst and at a temperature of from 180° to 250°C.

3,919,335
STABILIZATION OF CHLOROAROMATICS

Richard H. Hall, Midland; Daniel H. Haigh, Beaverton; Wesley L. Archer, Midland, and Peter West, Wellesley, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 5, 1973, Ser. No. 337,941
Int. Cl.² C07C *25/14*
U.S. Cl. 260—651 R **11 Claims**

1. A chlorinated aromatic compound of the formula

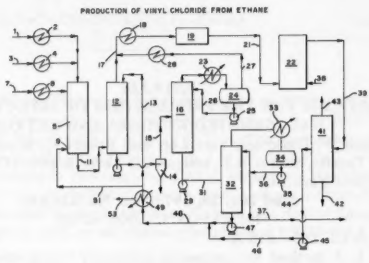


wherein A is a benzene or naphthalene nucleus, Y is H or lower alkyl, R and X are each Cl or H, at least one of R and X being Cl, R′ is H, CH_3 or CH_2Cl, m is one or two, and n is 0 or 1 containing as the essential stabilizer against attack by aluminum of at least about 0.1 percent by weight of a nitroalkane of 1–4 carbon atoms.

3,919,336
METHOD OF PREPARING VINYL CHLORIDE FROM LIQUID ETHYLENE DICHLORIDE

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,975
Int. Cl.² C07C *21/06*
U.S. Cl. 260—656 R **15 Claims**



1. A process for the production of vinyl chloride from ethylene dichloride, which comprises the steps of:
   a. intimately contacting a liquid ethylene dichloride quench and a hot gaseous stream essentially unreactive with ethylene dichloride, wherein the hot unreactive gaseous stream consisting essentially of ethylene and hydrogen chloride is at a temperature sufficient to convert the liquid ethylene dichloride to vinyl chloride; and
   b. recovering the converted vinyl chloride.

3,919,337
PREPARATION OF 1,1,2-TRICHLOROETHANE

Scott C. Gordon, Rockaway, N.J., and Ares N. Theodore, Farmington, Mich., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 1, 1973, Ser. No. 356,112
Int. Cl.² C07C *17/10*
U.S. Cl. 260—658 R **6 Claims**

1. A process for the uncatalyzed production of 1,1,2-trichloroethane which comprises introducing chlorine and 1,2-dichloroethane into a liquid reaction medium of 1,1,2-trichloroethane and 1,2-dichloroethane while maintaining said reaction medium at a temperature of at least 265°F. and at a pressure of at least 50 pounds per square inch gauge, reacting the chlorine and 1,2-dichloroethane, and recovering the 1,1,2-trichloroethane product.

3,919,338
IMPROVED PROCESS FOR THE LIQUID PHASE CHLORINATION OF C_5–C_{16} PARAFFIN HYDROCARBONS

Albert J. Henderson, and John E. Krol, both of Coraopolis, Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.

Continuation of Ser. No. 267,444, June 29, 1972, abandoned.
This application Mar. 12, 1974, Ser. No. 450,342
Int. Cl. C07c *17/10*
U.S. Cl. 260—660 **13 Claims**

1. In a process for the production of chlorinated paraffin hydrocarbons comprising chlorinating at a temperature of about 80° to 120°C. a paraffin hydrocarbon mixture which is a liquid at room temperature containing on the average eight to 16 carbon atoms per molecule and consisting mainly of saturated straight chain hydrocarbons while in the liquid state and present in a reaction zone wherein a gaseous mixture comprising a minor proportion of paraffin hydrocarbon vapor and gaseous chlorine exists in contact with said liquid hydrocarbon during at least a portion of the chlorination reaction; the improvement comprising providing in said reaction zone about 2 to 20 percent by weight based upon the weight of said

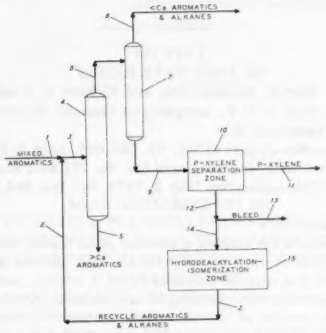
paraffin hydrocarbon mixture of an additive selected from the group consisting of carbon tetrachloride, chloroform, ethylene dichloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and perchloroethane, with said additive being under reflux during said chlorination reaction and at least partially volatilized and present in said gaseous mixture in contact with said liquid hydrocarbon where it serves to eliminate an undesirable reaction between said paraffin hydrocarbon vapor and said gaseous chlorine thereby improving the quality of the resulting chlorinated paraffin hydrocarbon product, and with no solvent for said hydrocarbon mixture being present in said reaction zone other than said minor concentration of said additive which primarily serves a role other than that of a solvent.

RJB DKK FWH

3,919,339
HYDROGENOLYSIS/ISOMERIZATION PROCESS

Derek L. Ransley, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 18, 1974, Ser. No. 452,489
Int. Cl. C07c *3/58*
U.S. Cl. 260—672 R **3 Claims**



1. A process for selective hydrodealkylation of ethylbenzene in a hydrocarbon feedstock comprising ethylbenzene and xylenes, to thereby convert ethylbenzene to toluene and benzene, and for simultaneous isomerization of the xylenes, which comprises contacting the feedstock with a catalyst consisting essentially of a cobalt component on a silica-alumina support at a temperature between 650° and 950°F., a pressure below 300 psig, and a hydrogen-to-hydrocarbon feed ratio between 1:1 and 20:1.

3,919,340
HYDROCARBON ISOMERIZATION PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 365,782, May 31, 1973, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970. This application Feb. 22, 1974, Ser. No. 445,019
Int. Cl.² C07C *5/22*
U.S. Cl. 260—683.2 **8 Claims**

1. A process for isomerizing a C_4 to C_{20} olefin by contacting said olefin at isomerization conditions which include a temperature of about 0°C. to about 425°C., a pressure of about atmospheric to about 100 atmospheres and a liquid hourly space velocity of about 0.1 to about 10, with a catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum or palladium, iridium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium are present in the corresponding elemental metallic states, wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal and wherein the atomic ratio of iridium to platinum or palladium contained in the composite is about 0.11:1 to about 2:1.

3,919,341
OLEFIN ISOMERIZATION PROCESS

Dalia Germanas, Des Plaines, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

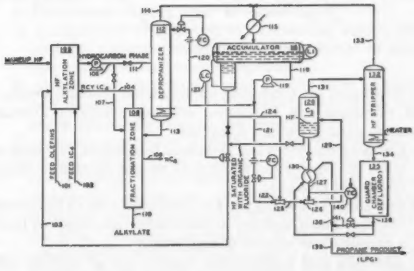
Division of Ser. No. 333,089, Feb. 16, 1973, Pat. No. 3,821,123. This application Jan. 22, 1974, Ser. No. 435,609
Int. Cl.² C07C *5/24*
U.S. Cl. 260—683.2 **2 Claims**

1. A process for isomerizing an isomerizable olefin which comprises contacting the olefin, at olefin isomerization conditions, with an olefin isomerization catalyst comprising a combination of a sulfur component and a catalytically effective amount of a nickel component with a porous carrier material, the catalyst containing less than about 0.9 and more than about 0.55 mole of sulfur per mole of the nickel component, calculated as the elemental metal, and the catalyst being prepared by the steps of: forming an initial composite of the nickel component and the carrier material, the nickel component being present in the initial composite as the elemental metal or the oxide; sulfiding the initial composite by contacting same with a sulfide yielding compound at sulfiding conditions to provide a sulfided composite containing at least about 0.9 mole of sulfur per mole of the nickel component in the sulfided composite; and stripping sulfur from the resulting sulfided composite with a hydrogen-containing gas at stripping conditions to provide the olefin isomerization catalyst, sufficient sulfur being stripped from the sulfided composite to provide a sulfur content in the catalyst of less than about 0.9 and more than about 0.55 mole of sulfur per mole of the nickel component in the catalyst.

3,919,342
PROPANE RECOVERY IN HF ALKYLATION UTILIZING EXTRACTION OR TWO-PHASE CONDENSATION FOR REMOVAL OF ORGANIC FLUORIDE

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. Nos. 169,631, Aug. 6, 1971, abandoned, and Ser. No. 177,609, Sept. 3, 1971, abandoned, and Ser. No. 357,663, May 7, 1973, abandoned. This application Oct. 18, 1973, Ser. No. 407,771
Int. Cl. C07c *3/52*
U.S. Cl. 260—683.42 **11 Claims**



1. A process for the alkylation of an isoparaffin with an olefin in the presence of HF acid catalyst which comprises alkylating isoparaffin with at least one olefin in the presence of HF acid catalyst, settling from the alkylation effluent a first hydrocarbon phase containing HF acid and organic fluoride,

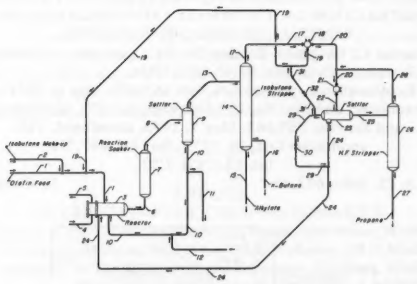
passing a first portion of said first hydrocarbon phase into a first fractionation zone and a second portion of said hydrocarbon phase to a second fractionation zone, separating a light hydrocarbon stream in said first fractionation zone and passing the remainder of said first portion to said second fractionation zone, recovering from said second fractionation zone an alkylate product and recycling isoparaffin, propane, HF, and organic fluoride from said second fractionation zone to said alkylation, condensing said light hydrocarbon stream to obtain a second hydrocarbon phase and an HF acid phase, returning a first portion of said second hydrocarbon phase as reflux to said first fractionation zone; mixing a second portion of said second hydrocarbon phase with at least a portion of said HF acid phase thus to extract from said second portion of said second hydrocarbon phase into said portion of said HF acid phase the organic fluoride which is in said second portion of said second hydrocarbon phase, settling the mixture of said second portion and said HF acid phase and recovering from said mixture an HF acid phase enriched by said organic fluoride and a third hydrocarbon phase from which organic fluoride has been removed, treating said third hydrocarbon phase from which organic fluoride has been removed to strip HF acid from the third hydrocarbon phase and recovering the stripped hydrocarbon from the process.

6. A process according to claim 1 wherein said alkylate product is intimately mixed with a portion of said HF acid phase to extract from said alkylate product into said portion of said HF acid phase the organic fluoride which is in said alkylate phase, thus recovering a substantially organic fluoride-free alkylate and HF acid containing organic fluoride.

3,919,343
ISOBUTANE-BUTYLENE ALKYLATION PROCESS

Jay E. Sobel, Highland Park, and Robert F. Anderson, La Grange Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 8, 1974, Ser. No. 467,974
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **5 Claims**



1. A process for producing an alkylation reaction product from isobutane and butylenes, utilizing hydrogen fluoride alkylation catalyst, which comprises:

a. admixing butylenes and isobutene feedstocks, said admixture containing from about 0.01 weight percent to about 10 weight propane;

b. said admixture being further combined with an isobutane recycle stream, derived as hereinafter specified, to form a hydrocarbon reactor charge stream;

c. admixing said hydrocarbon reactor charge stream with hydrogen fluoride alkylation catalyst in an alkylation reaction zone at alkylation conditions to form an alkylation reaction mixture;

d. settling the reaction mixture to form a settled catalyst phase and a first settled hydrocarbon phase;

e. recycling at least a portion of said settled catalyst phase to said alkylation reaction zone;

f. fractionating said first settled hydrocarbon phase to separate a first vapor comprising isobutane, propane and hydrogen fluoride from a liquid comprising said alkylation reaction product;

g. partially condensing said vapor to form a liquid condensate stream containing from about 50 weight percent to about 90 weight percent of the isobutane in said vapor and an uncondensed vapor stream comprising isobutane, propane and hydrogen fluoride;

h. admixing said liquid condensate stream with said feedstocks as said isobutane recycle stream in step (a);

i. condensing said uncondensed vapor stream and settling the resulting condensate to form a second settled hydrocarbon phase and a hydrogen fluoride phase;

j. stripping a first portion of said second settled hydrocarbon phase to separate hydrogen fluoride vapor from propane and isobutane;

k. commingling said hydrogen fluoride vapor from step (j) with said uncondensed vapor stream from step (i) to be condensed therewith as aforesaid;

(l). commingling a second portion of said second settled hydrocarbon phase with said liquid condensate stream for admixture with said feedstocks.

3,919,344
SILANOL-FREE RESINS

Duane F. Merrill, Ballston Spa, and Richard C. Cooke, Jr., Elnora, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 366,495, June 4, 1974, abandoned, which is a division of Ser. No. 231,403, March 2, 1972. This application May 2, 1974, Ser. No. 466,227
Int. Cl.² C08L *43/04, 83/04*
U.S. Cl. 260—825 **3 Claims**

1. A process for making a silicone paint having enhanced resistance to thermal shock wherein said silicone paint is composed of a silicone polyester resin, a solvent, and a pigment comprising incorporating in said silicone paint 10 to 30 percent by weight of the total resin content in the paint, a plasticizing silicone resin which is a random copolymer and having a silanol content of less than 0.5 weight percent where the R to Si ratio may vary from 1.1:1 to 1.5:1 and composed of chemically combined $RSiO_{3/2}$ units and R_2SiO, and the ratio of the $RSiO_{3/2}$ units to R_2SiO units may vary from 1:2.5 to 1:5.0 where R is selected from the group consisting of alkyl radicals of 1 to 8 carbon atoms, alkenyl radicals of 2 to 8 carbon atoms, cycloalkyl radicals of 5 to 7 carbon atoms, mononuclear aryl radicals, mononuclear aryl lower alkyl radicals where the alkyl radical has 1 to 6 carbon atoms, and halogenated derivatives of the foregoing radicals.

3,919,345
POWDERED COATING COMPOSITION CONTAINING POLYANHYDRIDE, EPOXY AND ANHYDRIDE FUNCTIONAL COPOLYMER AND FLOW CONTROL AGENT

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 4, 1974, Ser. No. 448,160. The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.
Int. Cl.² C08L *63/00*
U.S. Cl. 260—830 R **10 Claims**

1. In a method for coating a metal substrate wherein a thermosettable, film-forming powder is electrostatically sprayed upon said substrate and crosslinked thereon with heat, the improvement wherein said thermosetable film-forming powder consists essentially of a blend of

A. about 2 to about 8 weight percent of a polymer of monomeric anhydrides of saturated dicarboxylic acids having a molecular weight in the range of about 300 to about 4,000, and

B. about 92 to about 98 weight percent of an epoxy-functional, anhydride-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 10 to about 25 percent by weight of a glycidyl ester of a monoethylenically unsaturated acid, about 4 to about 12 percent by weight of a monomeric anhydride of an olefinically unsaturated dicarboxylic acid, and about 92 to about 63 to about 86 percent by weight of monofunctional, ethylenically unsaturated monomers, said copolymers being further characterized in having an average molecular weight in the range of about 2,000 to about 10,000 and a glass transition temperature in the range of about 40°C to about 90°C.

C. 0.05 to 4.0 weight percent of a polymeric flow control agent based on the weight of (A) and (B).

3,919,346

HEAT-CURABLE PULVERULENT COATING AGENT CONSISTING OF A MIXTURE OF COPOLYMERS CONTAINING ANHYDRIDES AND CURING ACCELERATORS

Themistoklis Katsimbas, Homburg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed May 30, 1974, Ser. No. 474,414

Claims priority, application Switzerland, June 26, 1973, 9313/73

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **11 Claims**

1. Pulverulent coating agent of a mixture of

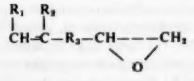
A. a copolymer of relatively low molecular weight, which contains glycidyl groups and is a copolymer of several ethylenically unsaturated compounds,

B. at least one dicarboxylic acid anhydride in an amount corresponding to 0.4 – 1.0 anhydride groups per epoxy group (glycidyl group) of the copolymer and

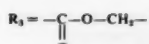
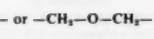
C. a curing accelerator in the form of an organic base,

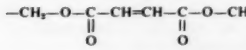
D. a flow control agent in an amount of at least 0.05 per cent by weight of the mixture, which agent is a polymer of molecular weight, (M_n) of at least 1,000 and has a glass transition temperature which is at least 50°C lower than the glass transition temperature of the copolymer (A), characterised in that the component (A) consists of 84 to 94 per cent by weight of copolymers containing epoxide groups and hydroxyl groups, which copolymers have Durran softening points of about 90°–120°C and are soluble in organic solvents and which consist essentially of:

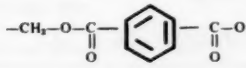
a. 6–24 per cent by weight of ethylenically unsaturated epoxide monomers with 6–12 carbon atoms, of the general formula



wherein R_1 and R_2 = H— or —CH_3

R_3 =  or  or

 or

 or zero,

b. 4–20 per cent by weight of hydroxyalkyl esters of acrylic acid or methacrylic acid, with the hydroxyalkyl ester group being saturated and containing 2–4 C atoms,

c. 24–45 per cent by weight of acrylic acid esters or methacrylic acid esters of aliphatic saturated monoalcohols with 1–8 carbon atoms and

d. 20–55 per cent by weight of styrene or vinyltoluene, the component (B) consisting of 6–16 per cent by weight of at least one dicarboxylic acid anhydride with melting points of about 60°–140°C,

the component (C) consisting of 0.5 –1.8 per cent by weight of N′,N′-bis-(dimethylamino isobutylidene)-melamine and the optional component (D) consisting of a flow control agent and other customary additives.

3,919,347

HEAT-CURABLE PULVERULENT COATING AGENT CONSISTING OF A MIXTURE OF COPOLYMERS CONTAINING GLYCIDYL GROUPS, DICARBOXYLIC ACID ANHYDRIDES AND CURING ACCELERATORS

Themistoklis Katsimbas, Hamburg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed May 30, 1974, Ser. No. 474,529

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **6 Claims**

1. Pulverulent coating agent of a mixture of

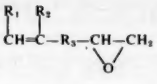
A. a copolymer of relatively low molecular weight, which contains glycidyl groups and is a copolymer of several ethylenically unsaturated compounds,

B. at least one dicarboxylic acid anhydride in an amount corresponding to 0.4 – 1.0 anhydride groups per epoxy group (glycidyl group) of the copolymer and

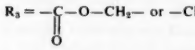
C. a curing accelerator in the form of an organic base,

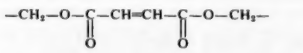
D. a flow control agent in an amount of at least 0.05 per cent by weight of the mixture, which agent is a polymer of molecular weight (M_n) of at least 1,000 and has a glass transition temperature which is at least 50°C lower than the glass transition temperature of the copolymer (A), characterised in that the component (A) consists of 84 to 94 per cent by weight of copolymers containing epoxide groups and hydroxyl groups, which copolymers have Durran softening points of about 90°–120°C and are soluble in organic solvents and consist essentially of:

a. 6–24 per cent by weight of ethylenically unsaturated epoxide monomers with 6–12 carbon atoms, of the general formula



Wherein R_1 and R_2 = H—or—CH_3

R_3 =  or —CH_2—O—CH_3— or

 or

or zero,

b. 4–20 per cent by weight of hydroxyalkyl esters of acrylic acid or methacrylic acid, with the hydroxyalkyl ester group being saturated and containing 2–4 C atoms,

c. 25–50 per cent by weight of methyl methacrylate and

d. 25–45 per cent by weight of other acrylic acid esters or methacrylic acid esters of aliphatic saturated monoalcohols with 1 to 8 carbon atoms,

the component (B) consisting of 6–16 per cent by weight of at least one dicarboxylic acid anhydride with melting points of about 60°–140°C, the component (C) consisting of 0.15–1.8 per cent by weight of N′,N′-bis-(dimethylaminoisobutylidene)-melamine and the optional component (D) consisting of a flow control agent and other customary additives.

3,919,348
EPOXY-STYRENE RESIN SYSTEM HAVING IMPROVED SHELF LIFE

Newton C. Foster, Pittsburgh, and James D. B. Smith, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1974, Ser. No. 472,754
Int. Cl.² C08L *63/00*
U.S. Cl. 260—837 R **15 Claims**

1. A resinous composition comprising the product of:

A. an epoxy diester, formed from the reaction of:

I. 1 part of a mixture of a solid epoxy resin having an epoxy equivalent weight of between about 390–2500 and a liquid epoxy resin having an epoxy equivalent weight of between about 100–385, wherein the weight ratio of solid epoxy resin: liquid epoxy resin is between about 1:1 to 1:10, with

II. between about 0.01 to 0.06 part of maleic anhydride and about 0.0001 to 0.005 part of a catalyst selected from the group consisting of piperidine, pyridine, imidazoles and aliphatic tertiary amines and mixtures thereof, wherein substantially all of the maleic anhydride is reacted with the epoxy resin mixture to form an epoxy diester having an acid number of between about 0.5 to 3.0 to which is added

B. between about 0.05 to 3.0 parts of a vinyl monomer co-reactive with the epoxy diester and about 0.00030 to 0.004 part of an aromatic nitrophenol selected from the group consisting of dinitrophenols and trinitrophenols and mixtures thereof; to form a solventless, resinous composition, having a viscosity of between about 5 to 500 cps at 25°C.

3,919,349
REMOVAL OF UNREACTED ACID FROM POLYTHYLENIC POLYESTERS

Richard A. Young, Buffalo Grove, and William J. Radak, Mount Prospect, both of Ill., assignors to De Soto, Inc., Des Plaines, Ill.

Filed Sept. 20, 1974, Ser. No. 507,902
Int. Cl.² C08L *63/00*
U.S. Cl. 260—837 R **12 Claims**

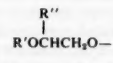
1. A method of producing a polyethylenic polyester substantially free of unreacted acid by direct esterification comprising directly esterifying an esterifiable aliphatic polyhydric alcohol with excess polymerizable monoethylenic monocarboxylic acid to produce a mixture of polyethylenic polyester and unreacted acid, and then adding an approximately stoichiometric proportion of epoxide to said mixture and maintaining said mixture at a temperature to cause said epoxide to adduct with said unreacted acid to thereby form a mixture of said polyethylenic polyester and epoxy ester.

3,919,350
POWDER COATING COMPOSITIONS

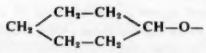
Naozumi Iwasawa; Minoru Shibata; Tadashi Watanabe, and Ichiro Yoshihara, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed May 29, 1973, Ser. No. 364,538
Claims priority, application Japan, May 31, 1972, 47-54550; May 31, 1972, 47-54553
Int. Cl.² C08L *61/20, 67/00*
U.S. Cl. 260—850 **10 Claims**

1. Powder coating composition comprising in powder form 4 to 20% by weight of a hexamethylolmelamine derivative and 96 to 80% by weight of a polyester having a softening point of 65° to 130°C, an acid value of 5 to 20 and an excess hydroxyl percentage of 5 to 30%, said hexamethylolmelamine derivative being at least one of etherified products of hexamethylolmelamine which have CH_3O— and RO— groups substituted for the hydroxyl group in the methylol group of hexamethylolmelamine, the average total number of the CH_3O— and RO— groups being 5.5 to 6.0 per melamine nucleus, the average number of the RO— group being 0.5 to 3.0 per malamine nucleus, wherein RO is



group or



group, R′ being an alkyl group having 1 to 4 carbon atoms and R″ being hydrogen atom or methyl group; said polyester being polycondensation product of polycarboxylic acid with polyhydric alcohol wherein said polycarboxylic acid is at least one member selected from the group consisting of benzene-1,2,4-tricarboxylic acid, phthalic acid, tetrahydrophthalic acid, hexahydrophthalic acid, endobicyclo-2,2,1-5-heptyne-2, 3-dicarboxylic acid, tetrachlorophthalic acid, succinic acid, isophthalic acid, terephthalic acid, azelaic acid, adipic acid, sebacic acid, anhydrides of such acids and alkyl esters thereof; and said polyhydric alcohol being at least one member selected from the group consisting of glycerin, trimethylolpropane, trimethylolethane, trishydroxyethyliso-cyanurate, pentaerythritol, ethylene glycol, diethylene glycol, propylene glycol, trimethylene glycol, 1,3-, 1,2- and 1,4- butanediols, heptanediol, hexanediol, octanediol, 2,2′-bis(4-cyclohexanol) propane, neopentyl glycol, and 2,2,3-trimethylpentane-1, 3-diol.

3,919,351

COMPOSITION USEFUL IN MAKING EXTENSIBLE FILMS

Wen-Hsuan Chang; J. Alden Erikson, both of Gibsonia, and Samuel Porter, Jr., Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,585
Int. Cl.² C08L 61/20, 67/00
U.S. Cl. 260—850 13 Claims

1. A coating composition consisting essentially of:

A. an ungelled reaction product of:

1. 1–30 percent by weight of an organic polyisocyanate;
2. 2–60 percent by weight of a polymeric polyol having a glass transition temperature of less than 50°C.;
3. 30–95 percent by weight of an interpolymer of:
   a. a hydroxyalkyl ester of an ethylenically unsaturated carboxylic acid; and
   b. at least one other copolymerizable ethylenically unsaturated monomer;

said interpolymer being different from said polymeric polyol; when said polymeric polyol is a polymeric acrylic polyol, the polymeric acrylic polyol having a glass transition temperature at least 10°C. lower than that of the interpolymer;

the equivalent ratio of isocyanate groups to hydroxyl groups in (1), (2) and (3) being between 1:1.1 and about 1:9; and

B. at least 1–60 percent by weight of an amine-aldehyde condensate curing agent.

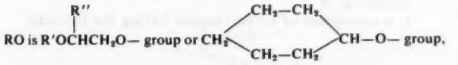
3,919,352

POWDER COATING COMPOSITIONS

Maozumi Iwasawa; Minoru Shibata; Tadashi Watanabe, and Ichiro Yoshihara, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed May 29, 1973, Ser. No. 364,533
Claims priority, application Japan, May 31, 1972, 47-54551; May 31, 1972, 47-54552
Int. Cl.² C08L 61/20, 61/26
U.S. Cl. 260—856 10 Claims

1. A coating composition comprising 4 to 20 percent by weight of a hexamethylolmelamine derivative and 96 to 80 percent by weight of an acrylic resin, said composition being in the form of a powder having a softening point of 65 to 130°C and an acid value of 5 to 20 and containing 0.4 to 2.0 mols of free hydroxyl group per kilogram of the resin, said hexamethylolmelamine derivative being at least one of etherified products of hexamethylolmelamine which have CH_3O- and RO- groups substituted for the hydroxyl group in the methylol group of hexamethylolmelamine, the average total number of the CH_3O- and RO- groups being 5.5 to 6.0 per melamine nucleus, the average number of the RO- group being 0.5 to 3.0 per melamine nucleus, wherein



R' being an alkyl group having 1 to 4 carbon atoms and R'' being hydrogen atom or methyl group, said acrylic resin being selected from the group consisting of homopolymers of acrylic acid and esters thereof and copolymers containing at least 50 percent by weight of acrylic acid or esters thereof.

3,919,353

IMPACT RESISTANT POLYESTERS COMPRISING A CROSSLINKED RUBBERY POLYMER

Lucio Castelnuovo, and Andrea Mattiussi, both of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Oct. 2, 1973, Ser. No. 402,737
Int. Cl.² C08G 39/10
U.S. Cl. 260—873 1 Claim

1. A process for producing an impact resistant polyester molding composition which comprises dispersing in a matrix of a linear polyester of an aromatic dicarboxylic acid or of a mixture of said aromatic acid with a small amount of an aliphatic dicarboxylic acid, and an aliphatic or cycloaliphatic saturated diol, said polyester having an intrinsic viscosity comprised between 0.65 dl/g and 1.5 dl/g, from 3–30% by weight on the weight of the composition of a polymeric material having a second order transition temperature lower than 0°C and selected from the group consisting of polybutadiene, butadiene-styrene copolymers, butadiene-acrylonitrile copolymers, ethylene-propylene rubbers, polyisobutene and polyisoprene and crosslinked for at least 30% by weight and grafted with monomers selected from the group consisting of acrylic esters of saturated aliphatic alcohols, methacrylic esters of saturated aliphatic alcohols, vinyl acetate, acrylonitrile, styrene and alkyl styrenes.

3,919,354

IMPACT RESISTANT POLYMERS OF A RESINOUS COPOLYMER OF AN ALKENYL AROMATIC MONOMER AND UNSATURATED DICARBOXYLIC ANHYDRIDE

Eugene R. Moore; Ronald G. Lehrer; Charles E. Lyons, and Leland Dennis McKeever, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 287,526, Sept. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 182,893, Sept. 22, 1971, abandoned. This application May 17, 1974, Ser. No. 471,087
Int. Cl.² C08L 9/06
U.S. Cl. 260—880 R 22 Claims

1. A polymer suitable for molding and extrusion, of substantially improved resistance to mechanical shock and impact, the polymer consisting essentially of the polymerization product of

a. a monovinyl alkenyl aromatic monomer containing up to 12 carbon atoms and having the alkenyl group attached directly to the benzene nucleus, the alkenyl aromatic compound being present in a proportion of from about 65 to 95 parts by weight and from 35 to 5 parts by weight of an unsaturated dicarboxylic acid anhydride readily copolymerizable therewith, and

b. from 5 to 35 parts by weight of a diene rubber per 100 parts of (a) plus (b), the rubber consisting essentially of 65 to 100 weight percent butadiene, or isoprene and up to 35 weight percent of an alkenyl aromatic hydrocarbon, the rubber having a glass temperature not higher than 0°C., the rubber being in the form of a plurality of particles having diameters within the range of 0.02 to 30 microns dispersed throughout a matrix of polymer of alkenyl aromatic monomer and the anhydride, at least a major portion of the rubber particles containing distinct occlusions of the polymer of (a), with the further limitation that

the polymer of (a) is a nonequimolar random copolymer.

3,919,355
METHOD FOR PREPARING SHOCK-RESISTANT GRAFTED COPOLYMERS OF STYRENE OR VINYLTOLUENE WITH SYNTHETIC RUBBER

Galina Dmitrievna Ballova, Prospekt Energetikov, 60, kv. 198; Ekaterina Ivanovna Egorova, Piskarevsky prospekt 9, korpus 3, kv. 85; Klavdiya Andreevna Sivograkova, ulitsa Vasenko, 5/15, kv. 52; Georgy Lazarevich Bezborodko, Piskarevsky prospekt, 9, korpus 3, kv. 94; Mariya Moiseevna Lebedeva, Skobelevsky prospekt, 5, kv. 122, all of Leningrad; Irina Ivanovna Rusinovskaya, Gatchina, ulitsa Gagarina, 16, kv. 26, Leningradskya oblast; Larisa Fedorovna Maladzyanova, Svetlanovsky prospekt, 72/1, kv. 174, Leningrad; Vladimir Nikolaevich Maximov, Kurlyandskaya ulitsa, 27, kv. 47, Leningrad, and Tamara Nikolaevna Ostrovskaya, prospekt Energetikov, 34, kv. 43, Leningrad, all of U.S.S.R.

Filed Aug. 15, 1974, Ser. No. 497,635
Int. Cl.² C08L *47/00*
U.S. Cl. 260—880 R **8 Claims**

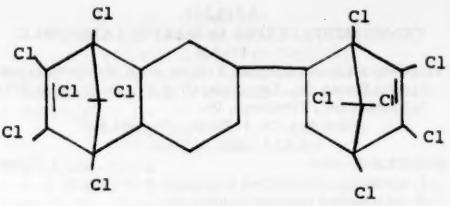
1. A method for preparing shock-resistant grafted copolymers of styrene with synthetic rubber, consisting in that rubber is dissolved in styrene at a temperature of 20° to 80°C, the obtained solution is heated at a temperature of 85°–125°C in the presence of a plasticizer and a regulator of molecular weight until the conversion of styrene is 25–40 per cent with formation of pre-polymer; the pre-polymer undergoes suspension-polymerization by heating in an aqueous medium to the temperature not above 140°C at the ratio of the pre-polymer ot water of 5:3 to 10:3 respectively in the presence of the polymerization initiators and a stabilizing system, consisting of 0.15 – 1.5 per cent by weight of tricalcium phosphate, 0.003 – 0.02 per cent by weight of a mixture of sodium salts of secondary alkylsulphates having the general formula R—O-SO_3Na, where R is a hydrocarbon radical, containing from 8 to 18 carbon atoms, and 0.15–0.35 per cent by weight of calcium carbonate, which is introduced into the process of suspension polymerization at a temperature not above 90°C.

3,919,356
HALOGENATED NORBORNENE-METHANONAPHTHALENE DERIVATIVES AND THEIR APPLICATIONS

Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 782,444, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 658,616, Aug. 7, 1967, abandoned. This application Dec. 20, 1971, Ser. No. 210,112
Int. Cl.² C08L *9/00*
U.S. Cl. 260—891 **5 Claims**

1. A flame retardant composition comprising (A) a polymeric base consisting of at least one polymer selected from the group consisting of polyisoprene, acrylinitrile-butadiene-styrene graft polymer and other ABS type resins, linear polybutadiene, crosslinked polybutandiene, polyisobutylene, polyamide, poly(styrene-acrylonitrile), polystyrene, polyvinyl chloride, ethylene-propylene rubber, ethylene-propylene terpolymer, polyethylene, poly(cyclopentadiene), acrylic rubber, polyphenylene oxide, polycarbonate, polyurethane, polypropylene and high impact polystyrene (B) a flame-retarding amount of an additive of the structure



and (C) from about 5% to about 14% by weight based on the total composition of a synergistic additive selected from the group consisting of antimony, oxide, zinc borate and mixtures thereof.

3,919,357
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS, CASE 2

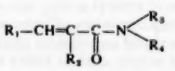
James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,581
Int. Cl.² C08L *39/08*
U.S. Cl. 260—895 **4 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and powdered polypropylene having an average molecular weight ranging from about 120,000 to about 350,00, said denture adhesive ingredients comprising:

A. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material selected from the group consisting of

1. a copolymer of an acrylamide having the formula:



(I)

wherein R_1 is methyl or hydrogen; and R_2, R_3, and R_4 are each hydrogen or 1 to 7 carbon lower alkyl, with a vinyl quaternary ammonium salt selected from the group consisting of trialkylaminoalkyl acrylate salts, trialkylaminoalkyl methacrylate salts, and vinyloxyalkyltrialkylammonium salts, wherein the alkyl group contains from 1 to 7 carbon atoms; and

2. a copolymer of an acrylamide having the formula (I) above with a vinyl or alkyl-substituted vinyl pyridinum salt, wherein the alkyl group is 1 to 7 carbon lower alkyl; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one anionic gum selected from the group consisting of copolymers of maleic acid with vinyl-lower alkyl-ether wherein the alkyl group has from 1 to 5 carbon atoms.

3,919,358

THERMOPLASTIC POLYMER BLENDS OF (1) EPDM HAVING A HIGH DEGREE OF UNSTRETCHED CRYSTALLINITY WITH (2) POLYETHYLENE

Martin Batiuk, Grafton; Richard M. Herman, Elyria, and James C. Healy, Avon, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 2, 1974, Ser. No. 494,028

Int. Cl.² C08L *23/12*

U.S. Cl. 260—897 A **7 Claims**

1. A thermoplastic polymer blend comprising (1) an EPDM polymer consisting essentially of interpolymerized units of about 65 percent to about 85 percent by weight of ethylene, about 5 percent to about 35 percent by weight of propylene, and about 0.2 percent to about 10 percent by weight of a diene monomer; said EPDM polymer having a weight percent unstretched crystallinity of from about 10 percent to about 20 percent by weight of the polymer and a melt endotherm value of about 6 to about 10 calories per gram and (2) from about 5 parts to about 200 parts by weight per 100 parts by weight of the EPDM polymer, of a polyethylene polymer.

3,919,359

ALKOXYALKYL PHOSPHONATES

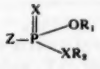
Karoly Szabo, Syracuse, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 60,773, Aug. 3, 1970, Pat. No. 3,733,379. This application Apr. 30, 1973, Ser. No. 356,045

Int. Cl.² C07F *9/40*

U.S. Cl. 260—942 **7 Claims**

1. Compounds characterized by the following structure:



wherein Z is a C_1 to C_8 alkyl—O—CH_2 group; X is either O or S; R_1 is a C_1 to C_6 alkyl group; R_2 is a (1,2-di-carbethoxy) ethyl group.

3,919,360

PHOSPHOGLYCOLOHYDROXAMIC ACID AND DERIVATIVES THEREOF

Kim D. Collins, Houston, Tex., assignor to Research Corporation, New York, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,276

Int. Cl.² C07F *9/09*

U.S. Cl. 260—943 **7 Claims**

1. Phosphoglycohydroxamic acid, the salts thereof with inorganic bases wherein the cations of said bases are selected from the group consisting of an alkali metal, an alkaline earth metal, and substituted ammonium wherein the substituent group is alkyl, wherein alkyl signifies 1–6 carbon atoms, cycloalkyl and dicycloalkyl of up to 6 carbon atoms and

the esters thereof with hydroxy compounds selected from the group consisting of alkyl alcohols of 1 to 20 carbon atoms, cyclo alkanols of 3 to 7 carbon atoms, phenol, and phenyl alkyl alcohols wherein the alkyl group contains 1 to 2 carbon atoms.

3,919,361

POLYFLUOROALKYL HYDROXYPROPYL PHOSPHATES

Atsuo Katsushima, Takarazuka; Shinichi Imazu; Shoshin Fukui, both of Toyonaka; Akitoshi Iwatani, Suita, and Tadashi Akazawa, Ibaragi, all of Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaka, Japan

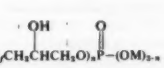
Filed Mar. 20, 1974, Ser. No. 452,968

Claims priority, application Japan, Mar. 23, 1973, 48-33320

Int. Cl.² C07F *9/11*; D06C *27/00*

U.S. Cl. 260—953 **2 Claims**

1. A polyfluoroalkyl hydroxypropyl phosphate having the formula



wherein R_f is a polyfluoroalkyl group having 1 to 24 carbon atoms, n is an integer of 1 to 3 and M is a hydrogen atom, alkali metal, ammonium radical or substituted ammonium radical derived from water-soluble amines and having as a substituent thereon an alkyl, hydroxyalkyl, alicyclic or aromatic groups.

3,919,362

O-ETHYL-S-N-PROPYL-O-3,4,5-TRIHALOPHENYL PHOSPHATES

Jozef Drabek, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

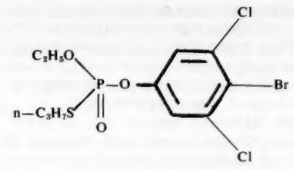
Filed Oct. 26, 1971, Ser. No. 192,477

Claims priority, application Switzerland, Oct. 26, 1970, 15775/70

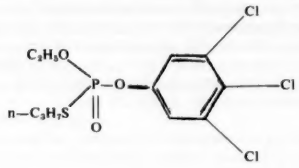
Int. Cl.² C07F *9/165, 9/24*; A01N *9/36*; C07F *9/40*

U.S. Cl. 260—964 **2 Claims**

1. The compound which has the formula



2. The compound which has the formula



3,919,363
PROCESS FOR PREPARING POLY(SULFONYL-PHENYLENE)PHENYLPHOSPHONATE

Yasukazu Ura; Yoshiharu Mori; Gojyo Sakata; Hideki Takamatsu, and Keiichi Kondo, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Japan

Filed Apr. 30, 1974, Ser. No. 465,525
Int. Cl.² C07F 9/40
U.S. Cl. 260—973 **8 Claims**

1. A process for preparing poly(sulfonyldiphenylene)-phenylphosphonate which comprises polycondensing dihydroxydiphenylsulfone and phenylphosphonic dichloride in tetrachloroethane, decreasing the viscosity of the resulting solution by adding 0.1 –2.5% of methanol based on total solvent and adding the solution to a methanol bath to precipitate poly(sulfonyldiphenylene)phenylphosphonate.

3,919,364
PROCESS FOR PREPARING PHOSPHORUS NITRILATE POLYMERS

Michael Alwyn Brown, Stenungsund, and Gert Harald Leopold Jangestrand, Uddevalla, both of Sweden, assignors to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden

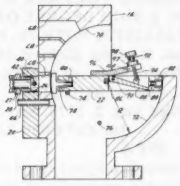
Filed July 2, 1973, Ser. No. 375,429
Claims priority, application Sweden, July 17, 1972, 9402/72
Int. Cl.² C07F 9/02
U.S. Cl. 260—973 **20 Claims**

1. A process for preparing phosphorus nitrilate polymers which comprises reacting a phosphorus nitrile halide and a hydroxyl compound having a hydroxyl group which is reactive with a phosphoric halide and selected from the group consisting of
   1. aliphatic and cycloaliphatic monohydric alkanols and halogen-substituted aliphatic alkanols having from one to about twelve carbon atoms;
   2. polyhydric alkanols having from two to six carbon atoms and from two to six hydroxyl groups and monomethyl and ethyl ethers thereof;
   3. polyoxyalkylene glycols having from two to four carbon atoms in the oxyalkylene groups and from two to four oxyalkylene groups; and mono methyl and ethyl ethers thereof;
   4. phenols having from one to two phenolic hydroxyl groups; alkyl phenols having from one to two phenolic hydroxyl groups and from one to two lower alkyl groups having from two to three carbon atoms;and halogen substituted such phenols and alkyl phenols having from one to five halogen atoms;
   5. phenalkyl alcohols having from one to three phenyl groups and from one to three carbon atoms in the alkyl groups;
   6. unsaturated alkenols having from three to twelve carbon atoms; and
   7. mixtures thereof; to form a phosphoric ester of the compound and hydrogen halide in the presence of an alkylene oxide having from two to twelve carbon atoms as a hydrogen halide acceptor which reacts with hydrogen halide to form a halohydrin at a temperature within the range from about 60° to about 130°C to form a reaction mixture comprising a phosphorus nitrilate polymer, and recovering the phosphorus nitrilate polymer from the reaction mixture.

3,919,365
CARBURETOR

Bernard O. Labelle, 5150 Forester St., St. Hubert, Taillon, Quebec, Canada

Continuation-in-part of Ser. No. 396,357, Sept. 12, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,600
Int. Cl.² F02M 11/10
U.S. Cl. 261—41 C **21 Claims**



1. A carburetor for an internal combustion engine comprising:
   a. a vaporization chamber adapted to be installed so as to be in communication with the piston chambers of the engine,
   b. at least one tube connected at one end to the said vaporization chamber, the said tube having, through its periphery, a multiplicity of fine holes in communication with the atmosphere for receiving air jets inside the tube and providing air to the vaporization chamber,
   c. a conduit means for feeding a fine stream of fuel into the tube at a location corresponding substantially to the intersection of the tube and the chamber, the said conduit means being substantially smaller than the said tube, the said fuel being pulverized by the air jets sucked through the holes in the tube by the vacuum created in the vaporization chamber by the engine,
   d. a closure member displaceably mounted in said vaporization chamber and adapted to vary the rate of flow of the air-fuel mixture sucked through the tube by the vacuum created in the vaporization chamber by the engine, and
   e. means for moving said closure means for varying the speed of the engine
   whereby the air entering through the fine holes produces very rapid air jets inside the tube in the direction of the fine stream of fuel so as to pulverize the fuel when entering the vaporization chamber.

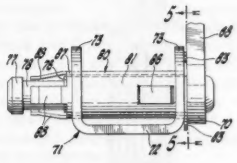
3,919,366
BUSHING FOR CARBURETOR PLATE LINKAGE

Richard K. Judd, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 519,835
Int. Cl.² F02M 7/22
U.S. Cl. 261—50 A **2 Claims**

1. A carburetor comprising, in combination: a housing defining an induction throat; a plate disposed rotatably in the

induction throat; a bracket disposed on the plate, the bracket including a pair of projecting ears, each ear having a circular opening therethrough, the circular openings being coaxial; a plate-following link having a cylindrical pin projecting therefrom through the circular openings; a bushing including a generally cylindrical sleeve extending through the circular openings around the pin, one or more stops at the end of the sleeve adjacent the link, the stops being engageable with the plate to prevent rotation of the bushing with respect thereto and further engageable with the ear adjacent the link to prevent withdrawal of the bushing from the circular openings in one direction, the bushing further including one or more projecting members being deformable to allow insertion of the bushing through the openings but engageable with the ear adjacent the link to prevent withdrawal of the bushing from the ears in the other direction, the end of the bushing opposite the link being tapered to assist insertion of the bushing through the openings; and means provided for the pin near its end opposite the link for engaging the tapered end of the bushing to prevent the withdrawal of the pin from the bushing.



3,919,367

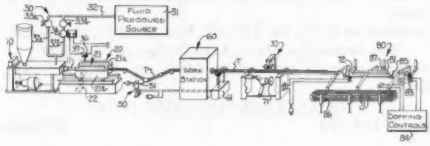
METHOD FOR MOLDING PLASTIC PIPE WITH ENLARGED PORTIONS FORMED THEREIN

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Continuation-in-part of Ser. Nos. 271,225, July 13, 1972, and Ser. No. 316,825, Dec. 20, 1972, Pat. No. 3,859,025. This application Oct. 9, 1974, Ser. No. 513,279

Int. Cl.[2] B29C *5/06, 5/10;* **B29D** *23/03, 23/04*

U.S. Cl. 264—40 **8 Claims**



1. In a method of producing a plastic tube by blow molding wherein enlarged sleeve portions are formed at spaced locations throughout the length of the tube, and wherein the method includes continuously extruding a tube of hot plastic material into a blow molding zone formed by a series of cooperating pairs of forwardly moving die blocks having concave inner surfaces defining a forwardly moving body-forming mold cavity and an adjacent forwardly moving enlarged sleeve-forming mold cavity of internal dimension greater than that of the body-forming mold cavity, the improvement which comprises expanding and molding the tube against the body-forming and sleeve-forming mold cavities during forward movement of the same through said blow molding zone by supplying internal fluid pressure in the hot plastic tube while periodically lowering the internal fluid pressure in the hot plastic tube to a reduced level during molding of the tube in the enlarged sleeve-forming mold cavity so as to avoid blowing holes in the hot plastic tube as the hot tube is stretched and expanded to conform with the enlarged sleeve-forming mold cavity and form enlarged sleeve portions in the tube.

3,919,368

SIMPLIFIED PROCESS AND APPARATUS FOR THE PRODUCTION OF CUPS FROM A FOAMED THERMOPLASTIC SHEET

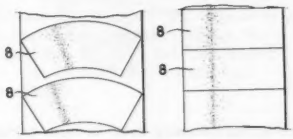
Jingo Seto, 29-6, Akatsuka Shinmachi 3-chome, Itabashi-ku, Tokyo, Japan

Filed Jan. 5, 1973, Ser. No. 321,214

Claims priority, application Japan, Jan. 14, 1972, 47-6348

Int. Cl. B29d *27/00*

U.S. Cl. 264—45 **5 Claims**



1. In a process for producing containers made of foamed plastics comprising the steps of:

cutting a side wall blank from an expansible foamed plastic sheet material to form the container wall,

curling the wall blank so that its longitudinal end portions overlap,

providing a separate bottom blank for the container, the bottom blank being cut out of a plastic or nonplastic sheet material, and

joining the wall and bottom blanks together to form them into the container with a joined overlapped wall seam,

the process characterized by (1) positioning the wall and bottom blanks in a predetermined space having a broader space section at each end thereof, the space being formed between female and male dies in position which are designed, when set in position, to form said space, (2) applying localized heating to top and bottom longitudinal end portions of the rolled blank to melt and expand said localized end portions whereby said localized heated end portions expand relative to the remaining portions of the rolled blank, said localized heating effecting melt bonding of said overlapped longitudinal end portions, (3) subsequently applying localized cooling to said localized heated end portion to form solidified outer crusts on said latter portions while the remaining inner sections remain in a moldable state, and (4) applying a longitudinally directed compressive force to said end portions to longitudinally foreshorten and thereby mold said latter portions into desired configurations to form fin-free, rigid rims on the top and bottom of the cup and to effect securement of the bottom blank to said rolled blank.

3,919,369

METHOD OF MANUFACTURING A SELF-CONTAINED LOW PRESSURE DROP FILTER

Herbert K. Holden, Bon Air, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 121,989, March 8, 1971, Pat. No. 3,715,869, which is a continuation-in-part of Ser. No. 764,788, Oct. 3, 1968, Pat. No. 3,611,678. This application Nov. 27, 1972, Ser. No. 309,932

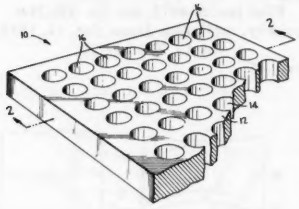
Int. Cl. B29d *27/00*

U.S. Cl. 264—45.1 **4 Claims**

1. A method of making a self-contained, low pressure drop filter comprising a grid with a plurality of through-openings forming voids, said filter having a ratio of void to filled face area of between about 60:40 and 16:84, said method comprising the steps of:

a. mixing activated carbon, a resin selected from the group consisting of thermosetting and thermoplastic resins; and sufficient water for processing;

b. charging the resulting mixture to a pin-mold;
c. applying at least about 250 psi pressure to said mixture to form a compressed piece;
d. discharging the compressed piece from said mold;



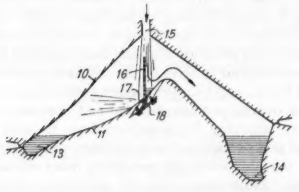
e. when a thermosetting resin is used, curing said compressed piece, and when a thermoplastic resin is used, fusing said compressed piece, thereby forming a bonded activated carbon filter; and
f. coating said compressed piece with a slurry of fine activated carbon and binder prior to curing or fusing.

3,919,370

MOULDING HEAT EXPANDABLE THERMOPLASTIC MATERIAL

Robert Frederick Joseph Cotterell, Quarndon, England, assignor to Profile Expanded Plastics Limited, England

Filed July 17, 1973, Ser. No. 379,926
Claims priority, application United Kingdom, July 21, 1972, 34307/72
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—45.4 **4 Claims**



1. In the manufacture of a shaped article from heat-expandable beads of thermoplastic material by pre-expanding the beads to different densities, mixing said beads of different densities in predetermined proportions to provide a mixture of beads of a specific average density, feeding said mixture of beads through a small filler opening in the top of the mould, varying the proportions of beads of different density fed through the filler opening so that the beads are deposited in layers of different average density in the mould, closing said filler opening, and then heating the beads to expand and fuse them together to form an article in which the density of the material varies within the article:

a method of distributing the mixture of beads to different parts of said mould comprising

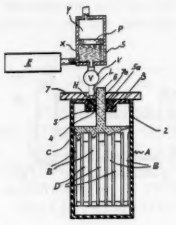
1. inserting a deflector plate into the mould through a slot in the wall thereof separate from the filler opening,
2. feeding the mixture of beads in a continuous stream through said filler opening and on to an edge of the deflector plate, whereby the deflector plate separates the flow of beads into two or more streams and deflects the streams towards different parts of the mould,
3. withdrawing the deflector plate through said slot after said parts of the mould have been filled with beads, and
4. closing said slot prior to heating the beads in the mould.

3,919,371

LEAKPROOF BONDING OF STORAGE BATTERY COMPONENTS

Otto Jache, Thiergarten, Budingen, Hesse, Germany

Continuation-in-part of Ser. No. 55,934, July 17, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,862
Claims priority, application Germany, July 17, 1969, 1936472
Int. Cl. B29c *27/00*; B29d *27/00*; B29f *1/06*
U.S. Cl. 264—46.6 **8 Claims**



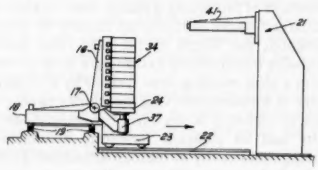
1. A method of bonding components of an electrical storage battery in leakproof relation comprising assembling the components into a relative position wherein a cavity is provided between those regions of the components at which the components are to be bonded together, maintaining said components in said relative assembled position, injecting at low pressure into said cavity a quantity of plastified thermoplastic polymeric material having a volume which is less than that of said cavity, and which has been rendered gas-expandable by addition of a foaming agent, and continuing to maintain said components in said assembled position until the injected gas expandable foamed, plastified thermoplastic material has expanded to fill said cavity, and has solidified to a multicellular mass having closed cells adhered to said components.

3,919,372

PROCESS FOR THE PRODUCTION OF BUILDING ELEMENTS FROM POROUS CONCRETE

Josef Vögele, Furstenfeldbruck, Germany, assignor to Hebel Gasbetonwerk GmbH, Emmering-Furstenfeldbruck, Germany

Continuation of Ser. No. 227,065, Feb. 17, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,229
Claims priority, application Germany, Feb. 20, 1971, 2108300
Int. Cl.[2] C04B *15/12*; B28B *11/14*
U.S. Cl. 264—82 **5 Claims**



1. A process of manufacture of porous concrete building elements comprising the steps of:

casting and stripping a block of concrete having a height equal to the height of the concrete building elements thereby defining a plurality of narrow sides on said block of concrete and a longitudinal length and transverse width thereby defining a pair of oppositely facing broad sides greater in area than the area of each of said narrow sides;

dividing said block while said block is lying on one of said broad sides longitudinally into plates by means of cutting wires extending parallel to said narrow sides of said block;

engaging at least two mutually perpendicular sides of said block and tipping the entire block through 90° onto said narrow side;

cutting said block transversely by means of cutting wires extending parallel to said narrow sides of said block while said block stands on said narrow side, said longitudinal cuts in said block having closed while said block is standing on one of said narrow sides so that a breaking out of block material will be prevented by the adherence of said block material across said longitudinal cuts during said transverse cut;

engaging said at least two mutually perpendicular sides of said block and tilting the entire cut block back through 90° to lie on said one of its broad sides and effect a reopening of said longitudinal cuts; and

placing the cut block in an autoclave while lying on said broad side with both the longitudinal and transverse cut gaps open and extending vertically, and steam-hardening the cut block in the autoclave.

3,919,373

METHOD OF MAKING A LIQUID CONTAINER FROM THERMOPLASTIC SYNTHETIC MATERIAL

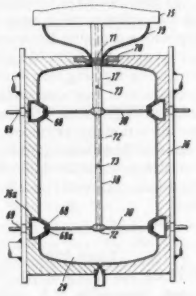
Kalman Kormendi, Karlsruhe, Baden, Germany, assignor to ELBATAINER Kunststoff- und Verpackungs-Gesellschaft mbH & Co., Ettlingen, Germany

Continuation of Ser. No. 72,389, Sept. 15, 1970, abandoned. This application Aug. 13, 1973, Ser. No. 387,853

Claims priority, application Germany, Sept. 16, 1969, 1946737

Int. Cl.² B29C *17/07;* **B29D** *3/02*

U.S. Cl. 264—89 **6 Claims**



1. A method of producing a closed liquid container of thermoplastic synthetic material, comprising the steps of

feeding a hollow empty plastic ally deformable and expandable synthetic material parison in a forming tool having mold halves openable and closable relative to each other transversely to the direction of feeding of said parison into said forming tool,

introducing at least one planar insert having an outer peripheral edge and constituting an independent part into said parison with substantial empty space on each side thereof, aligned in a plane perpendicular to a longitudinal axis of said parison and with said edge spaced from the walls of said parison, and during the open state of said mold halves of said forming tool,

pressing and connecting together said edge of said insert with a section of said walls of said parison aligned in said plane, prior to closing of said mold halves of said forming tool, by at least one forming tool section acting independently of the closing of said mold halves and disposed in said plane, by pressing said section of said walls of said parison against said edge of said insert to stabilize said walls, and only thereafter,

closing said mold halves, and

feeding a pressure medium into said parison enclosed in said forming tool while said parison is still a deformable state to impart a final shape to said parison.

3,919,374

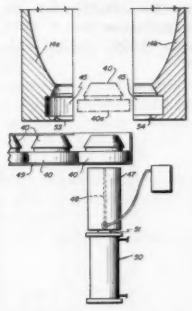
METHOD FOR BLOW MOLDING A CONTAINER HAVING AN AUXILIARY COMPONENT FORMED AS AN INTEGRAL PART OF IT

Henry Komendowski, Evanston, Ill., assignor to Automatic Liquid Packaging, Inc., Elk Grove Village, Ill.

Filed Apr. 23, 1973, Ser. No. 353,301

Int. Cl. B29c *17/07;* **B65b** *3/02*

U.S. Cl. 264—90 **1 Claim**



1. A method of automatically forming, filling and sealing a container to provide a completely sterile product within the container and to simultaneously mold an auxiliary component as an integral part of the container, all in a continuous automatic operation comprising the steps of:

a. providing a split mold having mold halves having therein a container forming cavity and a second cavity proportioned to receive therein said auxiliary component;

b. supporting said auxiliary component atop of pin means by a vacuum extended through a bore in said pin means, said pin means being extendable into and out of between said mold halves;

c. extending said pin means to position said auxiliary component between said mold halves and in alignment with said second cavity so as to be received therein when said mold halves are closed;

d. extruding a parison in the form of an elongated hollow tube between said mold halves to extend about and below said auxiliary component;

e. providing cutting edges on said mold halves which engage with said pin means for trimming off the excess parison below said auxiliary component when said mold halves are closed;

f. closing said mold halves about said parison to thereby confine a portion of said parison therebetween in said container forming cavity in said split mold and to compress the lower portion about said auxiliary component within said second cavity to mold said auxiliary component as an integral part of said container when the latter is formed and to close the lower end of said parison to permit it to be blown to form said container;

g. severing said parison to provide an opening into the other end thereof for receiving a composite filling and blowing tube;

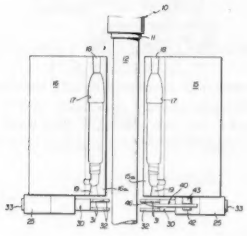
h. extending said composite filling and blowing tube into said opening into said parison;

i. blowing said parison to form said container and filling said blown container with a product;
j. retracting said composite filling and blowing tube from said opening into said parison;
k. providing forming and sealing means for closing the open end of said parison to hermetically seal the blown and filled container;
l. operating said forming and sealing means to hermetically seal the blown and filled container; and
m. opening said mold halves to remove said formed, filled and hermetically sealed container with the auxiliary component integrally molded therewith from said split mold.

3,919,375
PARISON ENGAGING, SEVERING AND STRIPPING METHOD

Robert F. Kontz, Toledo, Ohio, and Richard A. Morrette, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 220,857, Jan. 26, 1972, Pat. No. 3,796,530. This application Dec. 6, 1973, Ser. No. 422,311
Int. Cl.² B29C *17/07, 17/12, 17/14*
U.S. Cl. 264—99 **5 Claims**



1. In a method of blow molding a thermoplastic article, the steps of:
1. extruding a tubular parison along an axis of extrusion;
2. closing mold sections radially of the extrusion axis onto the parison to enclose the parison in a blow molding cavity;
3. during the closing movement of the mold sections:
a. engaging opposed sides of the parison with pairs of axially spaced engaging surfaces located exteriorly of the mold cavity, the surfaces of each such pair being radially aligned with the corresponding surfaces of the other pair;
b. pinching the parison shut by said parison engaging surfaces prior to full closure of the mold sections; and
c. severing the pinched parison portion between the axially spaced surfaces prior to full closure of the mold sections;
4. continuing to grip the pinched shut parison portions with the axially spaced engaging surfaces after severing; and
5. blowing the mold-enclosed parison portion to the configuration of the blow molding cavity.

3,919,376
PROCESS FOR PRODUCING HIGH MESOPHASE CONTENT PITCH FIBERS

David A. Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

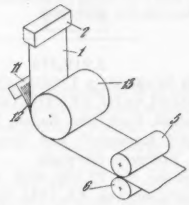
Filed Dec. 26, 1972, Ser. No. 318,482
Int. Cl. B24c *25/00*
U.S. Cl. 264—102 **36 Claims**

1. A process for producing a pitch fiber having a high mesophase content which comprises spinning a carbonaceous fiber from a nonthixotropic carbonaceous pitch containing from 40 percent by weight to 70 percent by weight mesophase, said mesophase being present in the form of large, homogeneous, coalesced regions, and heating the spun fiber under a pressure of less than 100 microns Hg at a temperature and for a time sufficient to volatilize at least a portion of the non-mesophase content of the fiber and produce a fiber of higher mesophase content.

3,919,377
PRODUCTION OF TAPES AND FIBROUS MATERIALS

James Dow, Thaxted; Ronald Lloyd, Sawbridgeworth, and Albert George Patchell, Welwyn Garden City, all of England, assignors to Smith & Nephew Polyfabrik Limited, Lancashire, England

Continuation of Ser. No. 50,189, June 26, 1970, abandoned. This application Dec. 11, 1972, Ser. No. 314,064
Claims priority, application United Kingdom, June 27, 1969, 32758/69
Int. Cl.² B29H *7/18*
U.S. Cl. 264—147 **13 Claims**

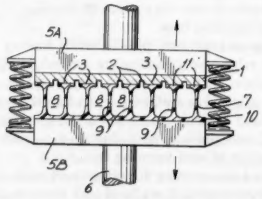


1. A method of producing a fibrous material from a thermoplastic polymer, said method consisting essentially of the steps of (1) melting said polymer and extruding the same as hot continuous molten film thereby defining an extrusion direction in the film, (2) passing said hot continuous molten film as a preformed film into a film treating zone, (3) within said film treating zone applying a dragging force across one surface of said free, preformed extruded film, (4) within said film treating zone simultaneously forming longitudinal spaced parallel uninterrupted grooves in at least one surface of said film, said grooves separated by longitudinal ribs, said grooves and ribs extending in the direction of extrusion, (5) removing the grooved film from said film treating zone and stretching said film to split it into tapes and to split the tapes along said grooves to form filaments, and (6) allowing the stretched filaments to relax.

3,919,378
BRISTLED ARTICLE AND PROCESS

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,479, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,472
Int. Cl.² B29D *5/00;* **B29C** *17/02*
U.S. Cl. 264—164 **11 Claims**



1. A process for integrally forming a bristled article from a blank of thermoformable material having a Ta in the form of

a sheet having a top surface and a bottom surface which comprises

inserting said blank between a top mold plate and a bottom mold plate, each of said mold plates having a surface for contacting the top and bottom surfaces of said blank, and each of said mold plates having a fusion point which is higher than the Ta of said thermoformable material,

the blank contacting surface of said bottom mold plate being continuous, and the blank contacting surface of said top mold plate having a pattern of channel means therein, said channel means being used to provide a pattern of channels at the interface between the top surface of said blank and the blank contact surface of the top mold plate, such pattern providing areas of contact between the top surface of the blank and the blank contact surface of the top mold plate at the non-channeled areas of said top mold plate, and such pattern also providing areas of non-contact between the top surface of the blank and the blank contact surface of the top mold plate at the channeled areas of said top mold plate,

heating said blank to at least its Ta so as to adhesively bond said blank by hot tack adhesion to the blank contacting surfaces of said mold plates,

pulling said mold plates apart while said blank is thus adhesively bonded thereto so as to draw a portion of the thermoformable material from the blank in the form of a plurality of discrete bristle elements, the pattern of occurrence of said bristle elements being determined by the pattern of areas of contact between the top mold plate and the blank,

said pulling apart effecting partial vacuum conditions between said bristle elements,

venting said channels during said pulling apart so as to equilibrate the lower level of pressure within said channels with the higher level of ambient pressure without said channels so as to thereby regulate the uniformity and integrity of the configuration of the bristles,

cooling the resultant expanded blank to a temperature below the heat distortion temperature of said thermoformable material, and

separating the cooled expanded blank from said mold plates.

3,919,379
FORMING A MULTICELL CONTAINER FROM A BLANK OF A THERMOFORMABLE MATERIAL

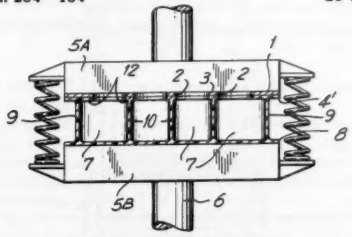
Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,450, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,479

Claims priority, application Canada, Nov. 15, 1972, 156744

Int. Cl.² B29C *17/02*

U.S. Cl. 264—164 **21 Claims**



1. A process for integrally forming a multicell container between the surfaces of mold plates from a blank of thermoformable material which is in the form of a sheet having a top surface and a bottom surface, said thermoformable material having a Ta, which comprises,

positioning said blank between a top mold plate and a bottom mold plate, each of said mold plates having a surface for contacting the top and bottom surfaces of said blank, and each of said mold plates having a fusion point which is higher than the Ta of said thermoformable material,

the blank contacting surface of said bottom mold plate being continuous, and perforation means being used to provide a pattern of perforations at the interface between the top surface of said blank and the blank contact surface of the top mold plate, such pattern providing areas of contact and non-contact between the top surface of the blank and the blank contact surface of the top mold plate when said mold plates are brought into contact with said blank,

bringing said plates together so as to cause them to contact said surfaces of said blank,

heating said blank to its Ta,

adhesively bonding said blank by hot tack adhesion to the blank contacting surfaces of said mold plates,

pulling said mold plates apart while said blank is thus adhesively bonded thereto so as to draw a portion of the thermoformable material from the blank in the form of a plurality of multiwalled cells having common walls therebetween and open ends defined by said pattern of perforations,

said pulling apart effecting partial vacuum conditions within said cells,

venting said cells during said pulling apart so as to equilibrate the lower level of pressure within said cells with the higher level of ambient pressure without said cells so as to thereby regulate the uniformity and integrity of the configuration of the cells,

cooling the resulting expanded blank to a temperature below the heat distortion temperature of said thermoformable material, and

separating the cooled expanded blank from said mold plates.

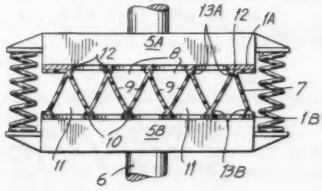
3,919,380
PROCESS FOR EXPANDING ANNEALED THERMOFORMABLE MATERIALS

Walter H. Smarook, Somerville, and John Sonia, Clinton, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,432, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,480

Int. Cl.² B29C *17/02*; **B32B** *3/12*

U.S. Cl. 264—164 **28 Claims**

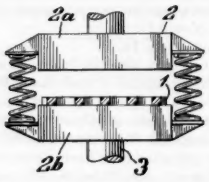


1. In a process for expanding the cross section of a blank of thermoformable material by pulling said blank, while it is in a thermoformable state, between a pair of oppositely positioned mold plates, said blank having residual stresses and associated frozen-in-strains therein, in which the improvement comprises annealing said blank to remove said stresses and strains therefrom prior to said pulling step.

3,919,381
PROCESS FOR EXPANDING A THERMOFORMABLE PREFORM NETWORK CONFIGURATION

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,296, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,494
Int. Cl.² B29C *17/02*
U.S. Cl. 264—164 **20 Claims**



1. A process for expanding the cross-section of a preform or blank having a lattice or network type of configuration formed from a thermoformable material exhibiting a Ta which comprises

positioning said preform or blank between a pair of platens while said preform or blank is heated to a temperature which is the Ta of said thermoformable material, each of said platens having surfaces which are adapted to contact said preform or blank and to being wet by said thermoformable material at such contact surfaces at the Ta of said thermoformable material,

bringing said platens together so as to cause them to contact said surfaces of said preform or blank,

adhesively bonding said preform or blank by hot tack adhesion to said contacting surfaces of said platens,

pulling said platens apart, while said preform or blank is thus adhesively bonded thereto, so as to thereby expand the cross-section of said preform or blank,

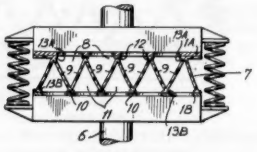
cooling the expanded preform or blank to a temperature below the heat distortion temperature of said preform or blank, and

separating the cooled, expanded preform or blank from said platens.

3,919,382
EXPANDING PROCESS WITH NON-ALIGNED MOLDS

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,353, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,496
Int. Cl.² B29C *17/02;* **B32B** *3/12*
U.S. Cl. 264—164 **22 Claims**



1. A process for expanding the cross section of a blank of thermoformable material between a pair of perforation means while said blank is in a thermoformable state,

each of said perforation means providing perforations adjacent the interface of contact between said perforation means and said blank, and the perforations in one perforation means being non-aligned with the perforations in the other perforation means,

said expanding being attended by the formation of one or more voids having a partial vacuum therein within the cross section of the expanding blank,

the pattern of occurrence of such voids being in response to the pattern of perforations in said perforation means,

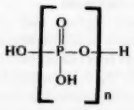
which comprises venting said voids during said expanding so as to equilibrate the lower level of pressure within said voids with the higher level of ambient pressure without said blank and thereby regulate the uniformity and integrity of the resulting cross-sectional geometry of the expanded blank.

3,919,383
HYDROLYTIC AND MELT DEGRADATION STABILIZED POLYESTER

Anthony Walter Yankowsky, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 336,396, Feb. 27, 1973, Pat. No. 3,839,272. This application July 5, 1974, Ser. No. 486,128
Int. Cl.² B28B *3/20*
U.S. Cl. 264—176 F **4 Claims**

1. In a process for manufacturing a rubber article reinforced with filaments of hydrolytic stabilized polyethylene terephthalate having not more than 20 free carboxyl end group equivalents per million grams of polyester, the improvement which comprises the step, in the manufacture of said polyethylene terephthalate, of adding to the antimony catalized polycondensation stage, when an intrinsic viscosity of at least 0.1 is reached, from 0.001 to 0.045 percent by weight of polyphosphoric acid having the structure.

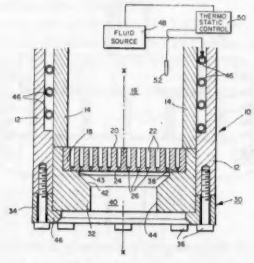


wherein *n* is greater than or equal to 3, subsequently hot melt extruding said polyethylene terephthalate to form continuous filaments and then bonding said filaments to rubber.

3,919,384
METHOD FOR EXTRUDING THIN-WALLED HONEYCOMBED STRUCTURES

Francis A. Cantaloupe, Horseheads; Rodney I. Frost, Corning, and Louis M. Holleran, Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 340,023, March 12, 1973, abandoned. This application June 24, 1974, Ser. No. 482,643
Int. Cl.² B28B *21/52;* **B29D** *23/04;* **B29F** *3/00*
U.S. Cl. 264—177 R **6 Claims**



1. A method of making a honeycombed structure by extruding a plastically deformable batch through a die apparatus comprising an extrusion die having an inlet face and an outlet face, an extrusion barrel in communication with the inlet face and an extrusion mask in communication with the outlet face,

the method comprising the steps of placing a plastically deformable batch in the extrusion barrel prior to extrusion, forming the extrusion batch through the extrusion die to form an extruded honeycombed structure and forcing the extruded honeycombed structure through an orifice in the mask so as to move peripheral portions of the extruded structure inwardly toward the extrusion axis and collapse peripheral cells to form an integral skin of material at the periphery of the structure, the improvement comprising the steps of providing the batch as a blended mixture of particulate material containing water and methyl cellulose and having a gel point, providing the batch at the time of placing it in the barrel with a temperature of about 2°–25°F. above the gel point of the batch, and maintaining the temperature of the extrusion barrel about 0°–15°F. less than the temperature of the batch placed in the barrel so as to form a substantially uniform skin at the periphery of the structure.

3,919,385

PROCESS FOR PRODUCING HIGH FLUID-HOLDING FIBER MASS

Frederick R. Smith, Wilmington, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 24, 1972, Ser. No. 309,076

Int. Cl. D01f *7/00, 3/10*

U.S. Cl. 264—184 **7 Claims**

1. A method for making fluid absorbent alloy fibers comprising mixing a cyanoethylated viscose and an aqueous solution of polyvinylpyrrolidone with a non-derivatized, filament-forming viscose, the latter of which constitutes the major portion of the mixture, shaping the mixture into streams, coagulating and regenerating the mixture forming the streams to provide filaments comprised of non-derivatized regenerated cellulose having uniformly dispersed therein regenerated cyanoethyl cellulose and polyvinylpyrrolidone, with the non-derivatized regenerated cellulose being the major portion thereof, and thereafter converting the filaments into dried fibers.

3,919,386

METHOD OF RAPIDLY FORMING HOLLOW OBJECTS FROM REINFORCED PLASTIC SHEETING

Leon Segal, Morristown, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,235

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B29C *27/12*

U.S. Cl. 264—255 **14 Claims**

1. A method of forming a continuous hollow object comprising the steps of:
   1. placing a first formable plastic charge of volume sufficient to yield a first section of the desired shape, said section having an expanded end and an opposite unexpanded end, between a relatively moving molding system comprising:
      a. an internal mandrel of a form corresponding to the inner shape of the desired article and
      b. external mated molding sections;
   2. closing the system and exerting sufficient pressure and heat to shape the charge around the mandrel;
   3. allowing sufficient time to permit the charge to solidify;
   4. removing the first section from the mandrel;
   5. placing a second formable plastic charge of volume sufficient to yield a second section of the desired shape, said second section having an unexpanded end and an opposite expanded end, between said relatively moving molding system;
   6. maintaining said unexpanded end of said first section in contact with the portion of said second formable plastic charge that forms said expanded end of said second section;
   7. closing the system and exerting sufficient pressure and heat to shape said second charge around the mandrel;
   8. allowing sufficient time to permit said second charge to solidify into a second section having its expanded end in contact with said unexpanded end of the first section;
   9. removing said second section from said mandrel; and
   10. repeating steps (1) through (9) to form a continuous hollow object.

3,919,387

PROCESS FOR PRODUCING HIGH MESOPHASE CONTENT PITCH FIBERS

Leonard S. Singer, Berea, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,483

Int. Cl. B29c *25/00*

U.S. Cl. 264—344 **30 Claims**

1. A process for producing a pitch fiber having a high mesophase content which comprises spinning a carbonaceous fiber from a nonthixotropic carbonaceous pitch containing from 40 percent by weight to 70 percent by weight mesophase, said mesophase being present in the form of large, homogeneous, coalesced regions, and extracting the non-mesophase content of the spun fiber with a solvent capable of dissolving the non-mesophase portion of the fiber but in which the mesophase portion is insoluble, so as to dissolve at least 10 percent by weight of the nonmesophase content of the fiber and produce a fiber of higher mesophase content.

3,919,388

PROCESS FOR PRODUCTION OF PIGMENTARY TITANIUM DIOXIDE

Peter Charles Thompson, Northallerton, and Thomas Aisbitt Bowbeer, Guisborough, both of England, assignors to British Titan Limited, England

Filed Apr. 9, 1973, Ser. No. 349,453

Claims priority, application United Kingdom, Aug. 18, 1972, 38536/72; Jan. 18, 1973, 2614/73

Int. Cl.[2] C01G *23/06, 23/08*

U.S. Cl. 423—69 **22 Claims**

1. A process for the production of pigmentary titanium dioxide comprising:
   converting an iron-containing titaniferous material to titanium tetrafluoride,
   reacting the titanium tetrafluoride with sulphuric acid to form titanium sulphate solution and hydrogen fluoride,
   removing hydrogen fluoride prior to hydrolysis of the titanium sulphate,
   forming an aqueous acidic solution of titanium sulphate,
   subjecting the aqueous acidic titanium sulphate solution to thermal hydrolysis to precipitate hydrous titanium dioxide, and
   thereafter calcining the hydrous titanium dioxide.

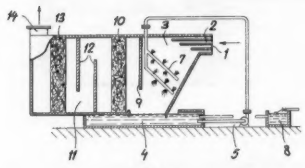
3,919,389
METHOD OF PURIFYING AIR CONTAINING MERCURY VAPOR

Vasile Jonescu, Bucharest, Romania, assignor to i Proiectari Automatizari si Proiectari Uzine si Instalatil Pentru Industria Electrotehnica Institutul de Cercetari, Bucharest, Romania

Continuation-in-part of Ser. No. 141,925, May 10, 1971, Pat. No. 3,817,713. This application Dec. 26, 1973, Ser. No. 428,192

Int. Cl. B01d *53/34*

U.S. Cl. 423—210 **5 Claims**



1. A process for the removal of mercury vapor from air contaminated therewith, comprising the steps of:

a. passing the contaminated air into a first chamber and treating the contaminated air therein with a finely divided aqueous solution of about 10% sodium sulfide;

b. collecting droplets of the sodium sulfide solution in said chamber;

c. passing the air treated with said sodium sulfide solution into a second chamber and conduiting the air along a tortuous path therein; and

d. intercepting droplets entrained with the air in said further chamber with a mist filter.

3,919,390
PROCESS AND COMPOSITION FOR CLEANING HOT FUEL GAS

Raymond H. Moore, Richland, Wash., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 12, 1974, Ser. No. 488,082

Int. Cl. B01d *53/34*

U.S. Cl. 423—210.5 **7 Claims**

1. A process for extracting hydrogen sulfide from a hot fuel gas stream which comprises contacting said gas stream with a molten carbonate salt mixture, said carbonate salt mixture consisting essentially of 10 to 20 mole percent calcium carbonate dissolved in a ternary mixture of 25 to 35 mole percent potassium carbonate, 15 to 40 mole percent lithium carbonate, and 25 to 40 mole percent sodium carbonate.

3,919,391
ELECTROSTATIC SCRUBBER-PRECIPITATOR

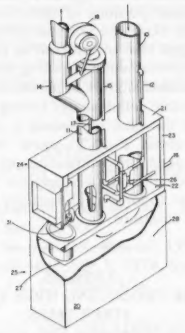
Addison B. Scholes, and Bruce F. Semans, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 9, 1973, Ser. No. 404,450

Int. Cl.² B01D *53/34*

U.S. Cl. 423—240 **2 Claims**

1. A method of removing from hot exhaust treatment gases hydroscopic materials including tin and titanium compounds and suspended particles, comprising: impinging the treatment gases with a spray of directed basic liquid, the treatment gases being between about 100° F. and 600° F., whereby the hydroscopic materials are hydrated forming aggregates ranging in size from about 1.5 to about 3.5 microns in average particle size and the suspended particles are wetted, cooling the treatment gases to a temperature below about 158° F., passing the gases proximate a reservoir of the basic liquid whereby some of the aggregates and wetted particles are entrapped in the reservoir, maintaining a saturated water vapor environment above said reservoir, exposing the impinged gases thereafter to ions in an electrostatic field so that the remaining aggregates and wetted particles are charged and travel under the influence of the field, and collecting the charged aggregates and particles by a thin descending liquid film.



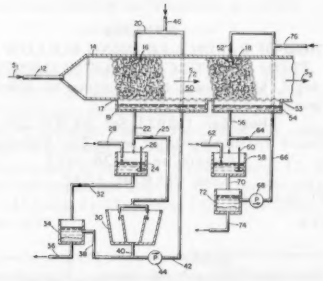
3,919,392
ABATEMENT AND SELECTIVE RECOVERY OF ACID GAS EMISSIONS

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 243,147, April 12, 1972, abandoned. This application Apr. 25, 1974, Ser. No. 463,653

Int. Cl.² B01D *53/34*

U.S. Cl. 423—240 **9 Claims**



1. A process for the selective and separate removal of hydrogen fluoride and sulfur dioxide from a gaseous mixture comprising the steps of:

a. passing said gaseous mixture through a first sorption zone in crossflow contact with a first aqueous solution of a basic compound selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate, potassium carbonate and mixtures thereof, while maintaining the pH of the solution effluent from said first sorption zone at not greater than 6 and maintaining the temperature of the gaseous mixture at not greater than 100°F while passing through said sorption zone so as to selectively remove hydrogen fluoride from the gaseous mixture and form a soluble fluoride salt in said first aqueous solution;

b. recovering said first aqueous solution together with fluoride dissolved therein as a liquid effluent from said first sorption zone;

c. diverting a large portion of about 50–90 percent of said liquid effluent while passing the remaining portion to a reaction vessel for reaction with calcium hydroxide;
d. neutralizing a portion of about 50–90 percent of the fluoride introduced into the reaction vessel by the addition of calcium hydroxide to precipitate calcium fluoride and regenerate a hydroxide solution;
e. separating the liquid and precipitate from said reaction vessel by mechanical means and recovering a solids-free hydroxide solution;
f. mixing said recovered, solids-free hydroxide solution with said diverted large portion of said liquid effluent from said first sorption zone;
g. recycling said mixed solution as the aqueous solution for said first sorption zone;
h. recovering said gaseous mixture from said first sorption zone substantially free of hydrogen fluoride and passing it through a second sorption zone in crossflow contact with a second aqueous solution of a basic compound selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate, potassium carbonate and mixtures thereof, while maintaining the pH of the solution effluent from said second scrubbing bed at between 6 and 13 so as to selectively remove sulfur dioxide from the gaseous mixture and form a soluble sulfite salt in said second aqueous solution; and,
i. recovering said gaseous mixture substantially free of both hydrogen fluoride and sulfur dioxide.

3,919,393
PROCESS FOR SULFUR DIOXIDE REMOVAL FROM COMBUSTION GASES

Joseph G. Selmeczi, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1973, Ser. No. 339,426
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 **10 Claims**

1. In a process for removing sulfur dioxide from gases resulting from the combustion of sulfur-containing fuels wherein the gases are subjected to a wet scrubbing step by contact with an aqueous solution of calcium oxide and a portion of the aqueous solution previously passed through said scrubber and clarified, with an effluent removed therefrom, the improvement comprising eliminating the formation of scale within said scrubber while minimizing the amount of dissolved magnesium sulfite and sulfate within the effluent by adding to said aqueous solution of calcium oxide 2–10% by weight of magnesium oxide, based on the total amount of calcium oxide and magnesium oxide.

3,919,394
PROCESS FOR THE REMOVAL OF OXIDES OF SULFUR FROM A GASEOUS STREAM

Joseph G. Selmeczi, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed May 14, 1973, Ser. No. 359,777
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 **11 Claims**

1. In a lime scrubbing process for removal of oxides of sulfur from a gaseous stream, wherein said gaseous stream is contacted in a scrubbing unit with an aqueous liquor containing calcium salts and wherein aqueous effluent from the scrubbing unit is clarified, with removal of a solids slurry containing predominantly solid calcium salts as reaction product, as clarifier underflow, and wherein aqueous liquor is recycled to the scrubbing unit; the improvement comprising preventing the formation of scaling within the scrubbing unit by adding to said calcium salt-containing liquor sufficient magnesium oxide to provide a magnesium ion content of 250–5000 parts per million by weight in said aqueous liquor within said scrubbing unit, so as to prevent saturation of the liquor with magnesium salts and significant resultant precipitation and loss of magnesium in the clarifier underflow, with the pH of said aqueous liquor being between 5.5 and 10.0 upon introduction of the scrubbing unit, to increase the alkalinity of the liquor and the removal of oxides of sulfur from the gaseous stream.

3,919,395
PROCESS FOR EXTRACTION OF PHOSPHORUS COMPOUNDS

Douglas O. Hauge, Moraga, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 90,542, Nov. 18, 1970, abandoned. This application Oct. 19, 1971, Ser. No. 190,511
Int. Cl. C01b *15/16, 25/26, 25/16*
U.S. Cl. 423—309 **23 Claims**

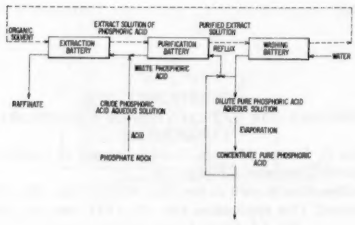
1. The process of treating apatite-containing ores which comprises:
introducing coarsely ground ore into the first end of a slowly rotating substantially horizontally mounted drum,
introducing introducing into the second end of said drum a 2.3–3 normal aqueous solution of a mineral acid whose calcium salt is water soluble,
moving said ore and said solution each toward the respective opposite end of said drum,
removing from said first end spent acid containing dissolved phosphates and fine particle-size solids,
separating the former from the latter,
removing from said second end moist coarse particles,
feeding said coarse particles into the first end of a second slowly rotating substantially horizontally mounted drum, together with a new supply of said acid, said supply having a normality between about 3 and about 7.5,
moving said coarse particles and said supply through said drum to its second end,
removing said supply and said coarse particles and separating the one from the other,
washing said coarse particles with water,
adding the wash water from said washing step to the separated fine particles removed from said first end of said first drum,
separating the fine particles from said wash water.
washing said fine particles with water,
and adding said fine particles wash water to the coarse particle wash water, the thus further diluted solution constituting the said 2.3–3 normal aqueous mineral acid supplied to said second end of said first drum.

19. A process for the recovery of phosphate values from phosphate ores which comprises the steps of:
a. treating a coarsely ground phosphate feed material in two separate stages with an about stoichiometric amount of a dilute mineral acid whose calcium salt is water soluble, at ambient temperatures, for a time sufficient to extract phosphate, but maintaining the phosphate concentration at a level not exceeding about 7% P_2O_5; the acid being added in two separate stages of differing strengths within the range of about 2–7.5 normality, the weaker being added first, and said treatment being with substantially non-attritional agitation;
b. treating the leach liquor, containing phosphoric acid, in a first precipitation step by raising the pH to about 1 to 2; and separating the precipitated impurities;
c. treating the liquor in a second precipitation step by raising the pH to a level of about 3 to 5; and separating the high purity calcium phosphate precipitate.

3,919,396
PHOSPHORIC ACID PURIFICATION

Itaru Toshimitsu; Sakumi Fujii, and Taketoshi Nakajima, all of Shin-Nanyo, Japan, assignors to Toy Soda Manufacturing Co., Ltd., Japan

Filed Jan. 8, 1974, Ser. No. 431,761
Claims priority, application Japan, Jan. 19, 1973, 48-7901
Int. Cl.² C01B 25/16
U.S. Cl. 423—321 6 Claims



1. In a process for the extraction and purification of impure wet process phosphoric acid comprising:

a. extracting said impure wet process phosphoric acid by countercurrently contacting said acid with a liquid organic solvent so as to form an impure extract solution of phosphoric acid,

b. purifying said impure extract solution of phosphoric acid by countercurrently contacting said solution with a reflux solution of a pure dilute aqueous solution of phosphoric acid so as to form purified acid extract solution and a waste aqueous phosphoric acid solution,

c. washing said purified acid extract solution by countercurrently contacting said solution with pure water so as to form a pure dilute aqueous solution of phosphoric acid,

d. concentrating at least a part of the dilute aqueous solution of phosphoric acid of step (c) by evaporation to remove water and to form a concentrated aqueous phosphoric acid solution product,

e. recycling the remainder of the pure dilute aqueous solution of phosphoric acid formed in step (c) to step (b) as said reflux solution,

the improvement comprising recycling part of said concentrated aqueous phosphoric acid of step (d) to step (b) so as to form a reflux solution having a higher concentration of phosphoric acid than that of said impure extract solution formed in step (a), and than that of said pure dilute aqueous solution formed in step (c).

3,919,397
CATALYTIC PREPARATION OF NO

Robert Kindade Gould, East Windsor, N.J., assignor to Aerochem Research Labs., Inc., Princeton, N.J.

Filed Nov. 30, 1973, Ser. No. 420,379
Int. Cl.² C01B 21/24
U.S. Cl. 423—405 1 Claim

1. A process for preparing a chemiluminescent reaction sample by the catalytic conversion of mixtures of nitric oxide and nitrogen dioxide gas to nitric oxide without conversion of the original nitric oxide component comprising the steps of:

a. flowing the gas mixture through a network of parallel flow tubes having a platinum wire catalyst wound through said tubes, the dimensions of said tubes and wire being such that substantially all of the gas mixture is brought into close intimate contact with said wire catalyst as the gas mixture flows through the tubes; and

b. resistively heating said wire catalyst to approximately 950°C to 1010°C to convert the nitrogen dioxide component of said mixture to nitric oxide.

3,919,398
RECOVERY OF HYDROGEN BROMIDE FROM AROMATIC BROMIDES

Ralph A. Davis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

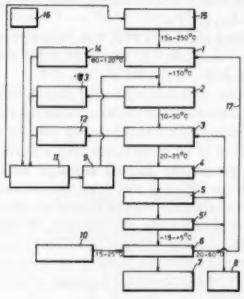
Continuation-in-part of Ser. No. 95,883, Dec. 7, 1970, Pat. No. 3,875,293. This application Aug. 29, 1974, Ser. No. 501,935
Int. Cl.² C01B 7/12
U.S. Cl. 423—481 22 Claims

1. A process comprising reacting an aromatic bromide with hydrogen at a temperature within the range of from about 200° to about 600°C in the presence of a palladium activated catalyst to form hydrogen bromide; and recovering hydrogen bromide from the reaction products.

3,919,399
PROCESS FOR PURIFYING AND CONDENSING REACTION GASES IN THE PRODUCTION OF HYDROFLUORIC ACID

Werner Schabacher; Hermann Rohe, both of Leverkusen; Wolfgang Keller, Bergisch-Gladbach-Paffrath, and Bernhard Spreckelmeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 26, 1973, Ser. No. 335,596
Claims priority, application Germany, Mar. 2, 1972, 2209960
Int. Cl.² C01B 7/22
U.S. Cl. 423—488 5 Claims



1. A process for recovering hydrogen fluoride from a mixture comprising hydrogen fluoride, SiF_4, SO_2, H_2SO_4, water vapor, inert gases and dust form impurities which comprises washing said mixture at a temperature of about 150° to about 250°C., in a first stage, with 95 to 99% sulfuric acid at a temperature of about 50 to 120°C. to thereby cool said mixture to a temperature of about 60° to 130°C., cooling residual gaseous mixture from said first stage, in a second stage, to a temperature of about 30° to 50°C. by indirect heat exchange with water, cooling residual gaseous mixture from said second stage, in a third stage, to a temperature from about 20° to about 25°C. by direct heat exchange with high purity liquid hydrogen fluoride, the ratio of liquid hydrogen fluoride used for direct heat exchange to gaseous hydrogen fluoride being cooled being from about 0.5:1 to about 1:1, cooling the residual gaseous mixture from said third stage to the dew point of hydrofluoric acid, in a fourth stage, to thereby condense hydrogen fluoride, cooling residual gaseous mixture from said fourth stage, in a fifth stage, to a temperature of from about −15° to 5°C. to thereby produce condensed hydrogen fluoride and a residual gaseous effluent and recovering condensed hydrogen fluoride produced in said fourth and fifth stages.

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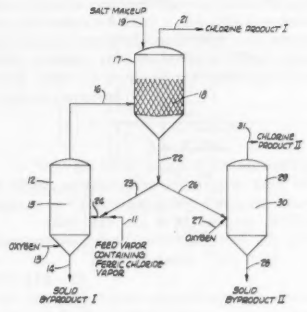
3,919,400
RECOVERING CHLORINE FROM FERRIC CHLORIDE VAPORS

James Paul Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,510
Int. Cl.² C01B 7/00
U.S. Cl. 423—502 7 Claims



1. In a process for recovering chlorine from feed bearing ferric chloride by oxidation of said ferric chloride with molecular oxygen in a ferric chloride oxidation zone, under ferric chloride oxidizing conditions, wherefrom iron oxide is withdrawn as a solid byproduct while chlorine gas and unreacted ferric chloride vapor is withdrawn as a crude vapor stream, the improvement which comprises:

contacting said crude vapor stream with sodium chloride in a complexing zone under conditions for converting unreacted ferric chloride vapor therein into liquid sodium ferric chloride salt complex;

withdrawing from said complexing zone a vapor stream containing chlorine gas as a first recovery product;

withdrawing said liquid salt complex from said complexing zone;

contacting withdrawn salt complex with additional oxygen in a salt complex oxidizing zone under conditions for converting said salt complex into additional chlorine gas, additional solid iron oxide and sodium chloride byproducts;

withdrawing said byproducts from said salt complex oxidizing zone; and

withdrawing said additional chlorine gas from said salt complex oxidizing zone as a second recovery product.

3,919,401
METHOD OF PREVENTING FORMATION OF SODIUM-IRON SULFATE IN THE PREPARATION OF SODIUM BISULFATE

Dong Myung Chay, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

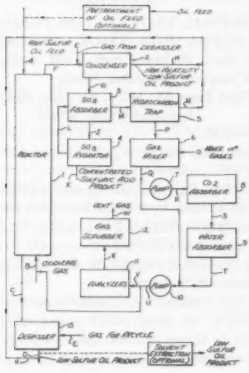
Filed July 29, 1974, Ser. No. 492,938
Int. Cl.² C01D 5/02
U.S. Cl. 423—520 7 Claims

1. In a process for the production of sodium bisulfate from a reaction mixture containing sulfuric acid with sodium chloride or disodium sulfate or a mixture of sodium chloride and disodium sulfate at an elevated temperature in an iron vessel in which $Na_3Fe(SO_4)_3$ also forms, the improvement which comprises adding phosphoric acid to the reaction mixture to prevent the formation of a significant amount of $Na_3Fe(SO_4)_3$.

3,919,402
PETROLEUM OIL DESULFURIZATION PROCESS

Eugene Daniel Guth, Palos Verdes Peninsula; Norman L. Helgeson, Pasadena; Kenneth W. Arledge, Playa Del Rey, and Anthony R. Brienza, Orange, all of Calif., assignors to KVB, Inc., Tustin, Calif.

Filed Aug. 6, 1973, Ser. No. 385,895
Int. Cl.² C01B 17/72; C10G 29/20
U.S. Cl. 423—522 16 Claims



1. A method of removing sulfur from liquid petroleum oil which has been fractionated to remove components which volatalize at the operating temperatures of said method, comprising the steps of:

a. oxidizing the sulfur compounds in said liquid petroleum oil at a temperature of about 50° to 350°F with an oxidizing gas containing (i) a total of about 0.5 to 15% volume % of one or more of the oxides of nitrogen selected from the group consisting of NO_2, N_2O_3, N_2O_4 and N_4O_5; (ii) about 1–30 volume % of oxygen and (iii) a remaining volume % of a gas which is inert in the oxidation and serves as a diluent to prevent the formation of an explosive mixture, to directly form gaseous sulfur oxide compounds including gaseous SO_3 as a constituent in the gas produced, thereby reducing the sulfur content of said petroleum oil; and

b. treating said SO_3 gas to produce concentrated sulfuric acid.

3,919,403
METHOD FOR THE PRODUCTION OF ALPHA ALUMINA MONOHYDRATE

Joseph B. Pullen, Annandale, Va., and Burton L. Mobley, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed July 17, 1972, Ser. No. 272,286
Int. Cl.² C01F 7/02
U.S. Cl. 423—628 4 Claims

1. A process for producing alpha alumina monohydrate having a pore volume of 0.65 to 0.85 c.c./g., a pore diameter of 95 to 125 Angstroms and a surface area of 200 to 300 m^2/g. comprising:

forming an aqueous solution of aluminum sulfate;

adding ammonia to raise the pH of said aluminum sulfate solution to about 2.7 to 3.5;

admixing a compound which will yield ammonia on thermal decomposition in an amount sufficient to raise the admixture to a pH of about 4.5 to 6.0 after decomposition of said compound;

heating said admixture to thermally decompose said ammonia yielding compound and homogeneously precipitating basic aluminum sulfate;

adding a basic compound selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide or sodium aluminate to said admixture, thereby increasing the pH to about 9.0 to 10.5 and forming alpha alumina monohydrate; and

recovering said alpha alumina monohydrate.

3,919,404
HYDROTHERMAL PROCESS FOR PREPARATION OF ALPHA IRON OXIDE CRYSTALS

Henry Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 28, 1974, Ser. No. 484,044
Int. Cl.² C01G *49/02*
U.S. Cl. 423—633 **4 Claims**

1. A process for preparing elongated hematite particles comprising:

a. providing a mixture consisting essentially of ferric sulfate, water and lithium hydroxide in which the concentration of iron sulfate is about 0.2 to about 2.0 molar, the atomic ratio of iron to lithium is from about 0.7 to about 1.5 and the total content of phosphate, molybdenum and tungsten is less than 0.001 molar;

b. heating said mixture to a temperature within the range of about 150°C. to about 350°C. at a rate of from about 1°/minute to about 38°/minute;

c. maintaining the mixture at said temperature under at least autogenous pressure for a time period of from about 1 minute to about 80 hours;

d. cooling the mixture while avoiding the formation of jarosites; and

e. recovering the resultant particles.

3,919,405
STABILIZATION OF ALKALI METAL AND/OR ALKALINE EARTH METAL HYDRIDES

Arnold Lenz, Cologne-Stammheim, and Walter Rogler, Ranzel-Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 60,633, Aug. 3, 1970, abandoned, and a continuation-in-part of Ser. No. 730,942, May 21, 1968, abandoned. This application Nov. 26, 1971, Ser. No. 202,654
Claims priority, application Germany, June 1, 1967, 53214
Int. Cl.² C01B *6/04*
U.S. Cl. 423—646 **3 Claims**

3. A flowable hydride powder stabilized against degradation by contact with air and atmospheric moisture comprising an hydride in powder form, having a particle size up to about 100 microns of metal selected from the group consisting of alkali and alkaline earth metals uniformly coated with a liquid saturated hydrocarbon boiling in the range of about 220° to 400°C., the amount of hydride coated with each part by weight of said hydrocarbon being approximately 40% of the numerical value of the particle size of said hydride, expressed in microns.

JFW

3,919,406
THERMOCHEMICAL PRODUCTION OF HYDROGEN

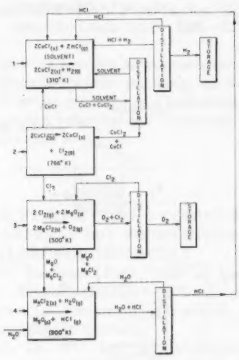
Warren R. Grimes, and Carlos E. Bamberger, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 10, 1974, Ser. No. 487,323
Int. Cl.² C01B *1/02, 1/26*
U.S. Cl. 423—648 **4 Claims**

1. A process for generating hydrogen, comprising the steps of:

adding CuCl to a liquid solvent for $CuCl_2$;

maintaining said solvent at a temperature within the range of 298° to 600°K;



bubbling HCl through said solvent and thus affecting a reaction between said CuCl and said HCl with said solvent to produce $CuCl_2$ and H_2 as products thereof;

exhausting the gaseous atmosphere above said reaction and recovering said H_2 therefrom.

3,919,407
METHOD FOR QUANTITATIVE DETERMINATION OF RENIN ACTIVITY IN BLOOD

Aurora L. Fernandez de Castro, 3311 Mall Court, Apt. C2, Michigan City, Ind. 46368

Filed Nov. 28, 1973, Ser. No. 419,623
Int. Cl.² C12K *1/00*; G01N *31/14, 33/16*
U.S. Cl. 424—12 **2 Claims**

1. In a method for measuring plasma renin activity in plasma wherein the plasma pH is adjusted in the presence of EDTA, adding inhibitors of the side reactions that interfere with the yield of Angiotensin I, incubation at 37° C to release Angiotensin I from the plasma, determining the amount of Angiotensin I, that improvement consisting of adding as inhibitor against Angiotensin I destruction phenylmethyl sulfonylfluoride so that the final concentration of phenylmethyl sulfonylfluoride is 0.066 to 3.3 mg of phenylmethyl sulfonylfluoride per milliliter of plasma, adjusting the pH to 4.0 to 7.4, and said inhibitor being effective to inhibit side reactions in the yield of Angiotensin I.

3,919,408
ALCOHOL-CONTAINING ORAL HYGIENE POWDERS

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 345,143, March 26, 1973, Pat. No. 3,821,433, which is a continuation-in-part of Ser. No. 240,272, March 31, 1972, Pat. No. 3,795,747. This application Mar. 4, 1974, Ser. No. 448,125
Int. Cl.² A61K *7/16*
U.S. Cl. 424—49 **11 Claims**

1. A method of preparing a flowable, dry-to-the-touch, alcohol-containing mouthwash powder which comprises:

a. dissolving in water a dextrin having a dextrose equivalent of from about 5 to about 15;

b. expanding the dextrin by forming a film of the solution of (a) and drying said film;

c. subdividing the dried film of dextrin to yield particulates of expanded dextrin having a size corresponding to a 20—60 mesh screen opening (U.S.S. Sieve), a moisture content ranging from about 2 to about 6% and a bulk density ranging from about 0.05 to about 0.30 grams/cubic centimeter;

d. contacting the expanded dextrin of (c) with an aqueous solution of ethanol so as to cause the dextrin to sorb from about 30 to about 60% ethanol by weight of the resulting flowable ethanol-containing powder; and

e. blending the alcohol-containing dextrin of (d) with small but effective amounts of mouthwash flavoring and coloring materials whereby a flowable powdered mouthwash mixture is prepared containing from about 30 to about 60% ethanol, said mouthwash being readily soluble in cold water to produce a mouthwash solution for oral hygiene purposes.

3,919,409

NOVEL DENTIFRICE COMPOSITION

Giulio Perla, and Giuseppe Mannara, both of Rome, Italy, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 16, 1972, Ser. No. 307,299

Claims priority, application Italy, Nov. 17, 1971, 54148/71

Int. Cl.[2] A61K *7/16, 7/18*

U.S. Cl. 424—52 **11 Claims**

1. An oral preparation comprising from about 0.05 to 10% by weight of finely divided particles of a C_{13} to C_{22} saturated fatty acid ester selected from the group consisting of di- and tri-esters of a compound selected from the group consisting of glycerol and ethylene glycol said particles having a macroscopic particle size within the range of 100 to 1000 microns and containing from 0.01 to 99% of a dentifrice additive.

3,919,410

SANITIZING PLASTIC MATERIAL

Robert H. McIntosh, and Ezekiel H. Hull, both of Greensboro, N.C., assignors to Anthony B. Askew, Atlanta, Ga.

Continuation of Ser. No. 292,772, Sept. 22, 1972, abandoned, Division of Ser. No. 139,265, April 30, 1971, Pat. No. 3,705,235. This application June 10, 1974, Ser. No. 478,109

Int. Cl.[2] A61L *13/00*

U.S. Cl. 424—78 **13 Claims**

1. A self-sanitizing plastic material including an effective amount of a sanitizing agent having a decomposition temperature above the melting point of the plastic material, said sanitizing agent consisting essentially of a nonionic trialkyl amine and a compound selected from the group consisting of a Group II-A or Group II-B metal salt of a monocarboxylic acid having a carbon chain length of 1 to 4.

3,919,411

INJECTABLE ADJUVANT AND COMPOSITIONS INCLUDING SUCH ADJUVANT

Max E. Glass; Stephen F. Donahue, both of Kansas City, Mo.; John T. Urton, Prairie Village, and Arthur Carlson, Jr., Overland Park, both of Kans., assignors to Bayvet Corporation, Shawnee Mission, Kans.

Continuation-in-part of Ser. No. 222,282, Jan. 31, 1972, Pat. No. 3,790,665, which is a continuation-in-part of Ser. No. 707,671, Feb. 23, 1968, Pat. No. 3,639,577. This application Feb. 4, 1974, Ser. No. 439,092

Int. Cl. A61K *23/00, 27/00*

U.S. Cl. 424—81 **30 Claims**

1. A liquid injectable antigenic antibody producing immunogen composition comprising:

an injectable antigenic substance; and

a sufficient amount of adjuvant for said antigenic antibody producing immunogen substance to increase the residual effectiveness thereof, said adjuvant including a polymer of acrylic acid cross-linked with polyallyl sucrose, and an emulsion system (based on a volume percentage basis totaling 100 percent) including a water and oil emulsion carrier comprised of at least about 25 percent to 85 percent by volume nontoxic vegetable oil, at least about 14 percent by volume water, and a nontoxic stable emulsion producing amount of a surfactant, said surfactant being present in an amount ranging from about 1 to 20 percent by volume and being selected from the group consisting of nonionic and amphoteric nontoxic surfactants,

there being from about 0.1 to 1 gram percent weight to volume of said polymer and from about 1 to 10 percent volume to volume of said emulsion system in said adjuvant.

3,919,412

VACCINE FOR NEONATAL CALF DIARRHEA

Charles A. Mebus, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Division of Ser. No. 405,997, Oct. 12, 1973, Pat. No. 3,873,422, which is a continuation-in-part of Ser. No. 302,179, Oct. 30, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,058

Int. Cl.[2] C12K *5/00*

U.S. Cl. 424—89 **8 Claims**

1. An attenuated calf diarrhea vaccine comprising an immunizing-effective amount of at least 10^2 $TCID_{50}$/ dose of a coronavirus-like calf diarrhea virus prepared by passaging said virus from 10 to about 60 times in tissue culture which supports the growth of the virus until the virus, when inoculated into newborn calves, prevents the development of disease upon subsequent challenge with virulent virus, and a liquid carrier therefor.

3,919,413

VACCINE FOR NEONATAL CALF DIARRHEA

Charles A. Mebus, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Division of Ser. No. 405,997, Oct. 12, 1973, Pat. No. 3,873,422, which is a continuation-in-part of Ser. No. 302,179, Oct. 30, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,521

Int. Cl.[2] C12K *5/00*

U.S. Cl. 424—89 **5 Claims**

1. A process for producing an inactivated coronavirus-like calf diarrhea virus vaccine comprising inactivating with an effective amount of an inactivating agent an adequate titer of a coronavirus-like calf diarrhea virus passaged in bovine cell culture and propagated from known coronavirus-like calf diarrhea virus which when virulent causes diarrhea in infected calves and combining it with an antibody enhancing amount of an adjuvant.

3,919,414

ACCELERATING THE LYSIS OF BLOOD CLOTS

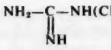
Marley Ann Herrin, Waukegan, Ill., and James Harold Short, Louisville, Ky., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 29, 1973, Ser. No. 392,577

Int. Cl. A61k *19/00, 27/00*

U.S. Cl. 424—94 **8 Claims**

1. The method of enhancing the lysis of a blood clot in vertebrates which comprises contacting said clot with effective amounts of urokinase and a guanidinoalkyl-sulfate ester of the formula:



wherein *n* is an integer from 2 to 6 inclusive, wherein 0.04 – 5.0 micromoles of said ester per CTA unit of urokinase activity is employed, and wherein said urokinase is employed in an amount which alone produces about 10 percent lysis.

3,919,415

SUBSTANCE MM 4550 AND PROCESS FOR PRODUCING SAME

Denis Butterworth, Redhill, and George Newbolt Rolinson, Newdigate, both of England, assignors to Beecham Group Limited, England

Filed Sept. 10, 1971, Ser. No. 179,279

Claims priority, application United Kingdom, Sept. 17, 1970, 44365/70; Sept. 17, 1970, 44366/70

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **3 Claims**

1. A process for preparing the substance MM 4550 which process comprises aerobically cultivating a substance MM 4550-producing strain of *Streptomyces Olivaceus* ATCC 21379, 21380, 21381 or 21382 in a nutrient medium containing assimilable sources of carbon, nitrogen and mineral salts at a temperature of 20° to 35°C for a period of 1–7 days, separating the solid and liquid components of the broth, concentrating the liquid component and isolating the substance MM 4550 from the concentrate.

3,919,416

AMMONIUM SULFATE AND AMMONIUM NITRATE ADMIXTURES AS BOLL WEEVIL ERADICANTS

Harvey S. Cosby, R.F.D. No. 3, Washington, Ga. 30673

Continuation of Ser. No. 574,938, Aug. 25, 1966, abandoned. This application Jan. 12, 1970, Ser. No. 1,956

Int. Cl.² A01N *11/00*

U.S. Cl. 424—162 **5 Claims**

1. The process of limiting the damage inflicted by boll weevils to a cotton crop, which comprises the steps of:

a. preparing a field for cotton planting;

b. applying a mixture of ammonium sulfate and ammonium nitrate to the field in weight proportions of approximately 70 to 80 percent of the former and 30 to 20 percent of the latter;

c. planting cotton in the field approximately 10 days subsequent to the application in step (b); and

d. controlling the damage inflicted by boll weevils on the growing cotton to at most first and second generation attacks thereby, by controlling the application of step (b) to not less than approximately 1,000 pounds per acre whereby a first generation adult boll weevil attacking the crop will ingest a lethal dose of toxic substance whereas any second generation pupa will also ingest a lethal dose of toxic substance.

3,919,417

METHOD FOR DECREASING THE REPRODUCTIVE FUNCTION OF MAMMALS

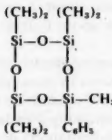
Donald R. Bennett, Midland, Mich., and James A. McHard, Gainesville, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 837,922, June 30, 1969, Pat. No. 3,830,912, which is a continuation-in-part of Ser. No. 741,336, July 1, 1968, abandoned. This application Dec. 5, 1973, Ser. No. 421,893

Int. Cl.² A61K *31/695*

U.S. Cl. 424—184 **6 Claims**

1. A method for decreasing the reproductive function of mammals which comprises administering to a mammal an effective amount in the range of from 5 mg. to 200 mg./kg. of mammal body weight of an organosilicon compound of the formula



3,919,418

METHODS OF KILLING INSECTS AND MITES USING CERTAIN PHOSPHORUS CONTAINING ORGANOTIN COMPOUNDS

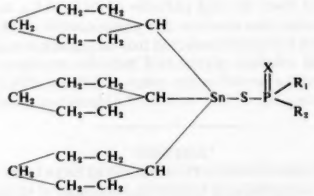
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 293,974, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application June 24, 1974, Ser. No. 482,034

Int. Cl.² A01N *9/36*

U.S. Cl. 424—216 **14 Claims**

1. A method of killing insects and mites which comprises contacting them with a lethal amount of a compound of the formula



wherein X is oxygen or sulfur and R_1 and R_2 can be the same or different and are selected from the group consisting of alkyl, alkoxy, cyclohexoxy, thiophenyl, haloalkyl, alkoxythioalkyl and thiocyano, wherein all alkyl and alkoxy groups contain from one to six carbon atoms.

3,919,419

INSECTICIDAL COMPOSITION CONTAINING DIMETHYL DICHLOROVINYL PHOSPHATE AND A POLYMER OF POLYETHYLENE FATTY ACID

Charles Zviak, Franconville, and Jean Daeninckx, Saint-Denis, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed May 14, 1971, Ser. No. 143,593

Claims priority, application Luxemburg, May 19, 1970, 60931

Int. Cl.² A01N *9/36*

U.S. Cl. 424—219 **5 Claims**

1. A stable and long lasting insecticidal composition comprising a homogeneous solution consisting essentially of dimethyldichloro vinyl phosphate and 40–60 percent by weight of a mixture of dimers and trimers of C_{18} fatty acids selected from the group consisting of linoleic and linolenic acid.

3,919,420

NOVEL ZOOTECHNICAL COMPOSITIONS

Jean Andre Grandadam, Saint-Maur des Fosses, France, assignor to Roussel-UCLAF, Paris, France

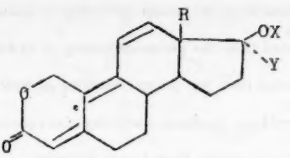
Filed Oct. 1, 1974, Ser. No. 511,097

Claims priority, application France, Oct. 19, 1973, 73.37344

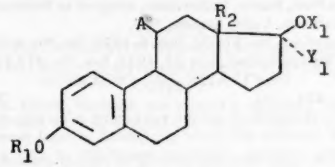
Int. Cl.² A61K *31/56*

U.S. Cl. 424—240 **9 Claims**

1. A zootechnical composition comprising a mixture of an anabolisant steroid of the formula



wherein R is alkyl of 1 to 4 carbon atoms, Y is selected from the group consisting of hydrogen and saturated and unsaturated alkyl of 1 to 4 carbon atoms and X is selected from the group consisting of hydrogen, saturated and unsaturated alkyl of 1 to 6 carbon atoms, one of which may be replaced by an oxygen atom and acyl of an organic carboxylic acid of 1 to 18 carbon atoms and an estrogenic steroid of the formula



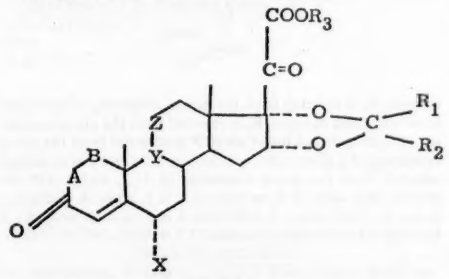
wherein R_2 is alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and cycloalkyl of 3 to 7 carbon atoms, A is selected from the group consisting of hydrogen and alkoxy of 1 to 4 carbon atoms, X_1 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, acyl of an organic carboxylic acid of 1 to 10 carbon atoms and aliphatic and selected from the group consisting of hydrogen, methyl, ethynyl and haloethynyl.

3,919,421
PREGNANOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Henry Laurent; Rudolf Wiechert; Helmut Hofmeister; Klaus Mengel; Hans Wendt, and Klaus Annen, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Dec. 20, 1973, Ser. No. 426,702
Int. Cl.² C01B 7/00
U.S. Cl. 424—241 **74 Claims**

1. Pregnanoic acid derivatives of the formula



wherein —A—B— is $—CH_2—CH_2—$, —CH=CH—, or —CCl=CH—; X is a hydrogen atom, a halogen atom, or methyl; —Y—Z— is —CH—CH_2—, —C=CH—, —CV—CHOU—, —CV—CO—, —CW—CHW'—, wherein U is a hydrogen atom or acyl, V is a hydrogen atom or a halogen atom, and W and W' each are a halogen atom; R_1 is alkyl; R_2 is alkyl or aryl; or R_1 and R_2 together are tetramethylene or pentamethylene, and R_3 is a hydrogen atom; an alkali metal atom, or hydrocarbon.

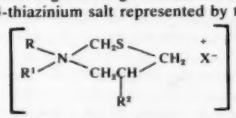
34. A pharmaceutical preparation containing a compound of claim **1** in admixture with a pharmaceutically acceptable carrier adapted for topical administration.

3,919,422
PROCESS FOR CONTROLLING MICROORGANISMS WITH TETRAHYDRO-1,3-THIAZINIUM SALTS

Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 220,372, Jan. 24, 1972, Pat. No. 3,821,210. This application Apr. 17, 1974, Ser. No. 461,556
Int. Cl.² C01B 31/81; A01N 11/00
U.S. Cl. 424—246 **4 Claims**

1. The method of killing and inhibiting the growth of fungi comprising contacting the fungi with an effective amount of tetrahydro-1,3-thiazinium salt represented by the formula



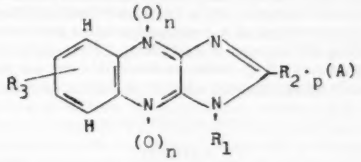
where X is an anion selected from the group consisting of chloride, bromide, iodide, acetate, formate, perchlorate and tosylate, R^2 is hydrogen or hydroxyl, and R and R^1 are independently alkyl having one to 20 carbon atoms or alkyl having one to 20 carbon atoms substituted with one or two hydroxyl groups, the total of the number of carbon atoms in $R + R^1$ being from about 12 to 24.

3,919,423
IMIDAZOQUINOXALINE FUNGICIDES

Donnie Joe Sam, Newark, Del., and Mark A. Wounola, Cambridge, Mass., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 277,604, Aug. 1, 1972, abandoned. This application June 13, 1973, Ser. No. 369,740
Int. Cl.² A01N 9/22
U.S. Cl. 424—250 **15 Claims**

1. The method of preventing injury to plants due to fungi consisting essentially of applying to the plants a fungicidally effective amount of a compound of the formula



wherein:

R_1 is hydrogen, methyl, ethyl, allyl, propargyl, chlorinated alkanesulfenyl of 1 to 2 carbon atoms and 3 to 4 chlorine atoms, methoxycarbonylmethyl, ethoxycarbonylmethyl, carboxymethyl, benzyl, 2,2,2-trichloro-1-formamidoethyl, sodium, potassium, lithium, the sodium, potassium or lithium salts of carboxymethyl or

R_2 is n-alkyl of 1 to 4 carbon atoms or cyclopropyl;

R_3 is hydrogen, bromine, chlorine or fluorine;

R_4 is alkyl of 1 to 9 carbon atoms; alkyl of 1 to 9 carbon atoms substituted with chlorine, bromine or methoxy; alkenyl of two to four carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl; phenyl substituted with bromine, chlorine, fluorine or methyl; 2-furoyl; benzyl; alkoxy of 1 to 6 carbon atoms; alkylthio of 1 to 6 carbon atoms; alkylamino of 1 to 6 carbon atoms; chlorosulfonylamino; or anilino;

n is 0 or 1;

p is 0 or 1;

A is H_2SO_4, HCl, HBr, HNO_3, or H_3PO_4 provided that

a. when R_1 is methyl, chloroalkanesulfenyl or metal salt of carboxymethyl, then *p* is 0,

b. when n is 1 and R_3 is hydrogen, R_1 is

c. when n is 1 and R_1 is other than

R_3 is chlorine, bromine or fluorine

d. when R_2 is methyl or n-butyl and R_3 is hydrogen, R_1 is

and

e. when R_2 is methyl or n-butyl and R_1 is other than

R_3 is chlorine, bromine or fluorine.

3,919,424

BRONCHODILATOR PROCESS AND COMPOSITION

William T. Comer, and Herbert R. Roth, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 229,202, Feb. 16, 1972, Pat. No. 3,801,631. This application Oct. 15, 1973, Ser. No. 406,524
Int. Cl.² A61K *31/205, 31/18*
U.S. Cl. 424—316 **12 Claims**

1. A brochodilator composition in dosage unit form suitable for administration to a mammal comprising a liquid or solid pharmaceutical carrier and a non-toxic bronchodilator effective dosage amount of a compound selected from the group consisting of 2′-hydroxy-5′-[1-hydroxy-2-(2-methyl-1-phenyl-2-propylamino)ethyl]-methanesulfonanilide and the pharmaceutically acceptable acid addition and metal salts thereof.

3,919,425

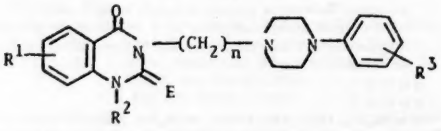
METHOD OF PRODUCING VASODILATION USING CERTAIN 3-SUBSTITUTED-QUINAZOLINE DERIVATIVES

Horacio Vidrio, Mexico City, Mexico, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 132,911, April 9, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 336,946
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A61K *31/305*
U.S. Cl. 424—251 **23 Claims**

1. A therapeutic method of producing vasodilation in an animal in need of such therapy comprising:

administering to said animal an effective dose of a substance selected from the group consisting of compounds having the formula



and pharmaceutically acceptable acid addition salts thereof, wherein:

R^1 is selected from the group consisting of hydrogen and halogen;

R^2 is selected from the group consisting of hydrogen and methyl;

R^3 is selected from the group consisting of hydrogen and halogen;

E is selected from the group consisting of oxygen and sulfur; and

n is an integer ranging from 1 to 6, inclusive.

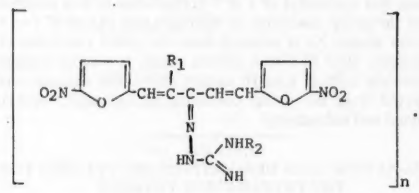
3,919,426

MOLECULAR COMPLEXES OF A BIS-(5-NITROFURFURYLIDENE)-ACETONEGUANYL-HYDROZONE COMPOUND AND AN AMINE

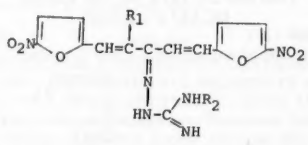
Jacobus Nooi, Baarn, Netherlands, assignor to Heterochemical Corporation, Valley Stream, N.Y.

Division of Ser. No. 87,632, Nov. 6, 1970, Pat. No. 3,778,435. This application June 25, 1973, Ser. No. 373,279
Int. Cl.² A23K *1/00;* **C07D** *307/70*
U.S. Cl. 424—251 **7 Claims**

1. An animal feed premix containing a carrier and from about 4 to about 64 grams per pound of total premix of a molecular complex consisting essentially of (A) a bis-(5-nitrofurfurylidene)-acetoneguanylhydrazone compound selected from the group consisting of:



and



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl and halogen, R_2 is selected from the group consisting of hydrogen and lower alkyl, X is selected from the group consisting of a mono-, di-, and tribasic acid and *n* is an integer selected from the group consisting of 1, 2, and 3 with the proviso that when X is monobasic *n* is 1, when X is diabasic *n* is 1 or 2 and when X is tribasic *n* is 1, 2, or 3, and (B) 2-hydroxy-4,6-dimethylpyrimidine.

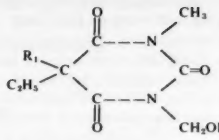
3,919,427

THERAPEUTIC COMPOSITIONS CONTAINING 1-METHYL-3-ALKOXYMETHYL-5,5-DISUBSTITUTED BARBITURIC ACID COMPOUNDS

Julius A. Vida, Boston, and Carlos M. Samour, Wellesley, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Division of Ser. No. 259,252, June 2, 1972. This application June 10, 1974, Ser. No. 477,980
Int. Cl.² A61K *31/515*
U.S. Cl. 424—254 **8 Claims**

8. The method of treating convulsions in warm-blooded animals which comprises administering to said animals an effective amount of compound having the structual formula



wherein R is an alkyl group having 1-4 carbon atoms and R_1 is a phenyl group or an ethyl group.

3,919,428

2-AMINO-5-(SUBSTITUTED OR UNSUBSTITUTED PHENYLALKYL)1,3,4-THIADIAZOLES FOR TREATING ANXIETY

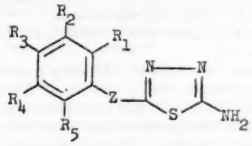
Marcel K. Eberle, Madison, and Robert E. Manning, Mountain Lakes, both of N.J., assignors to Sandoz Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 218,558, Jan. 17, 1972, abandoned, and a continuation-in-part of Ser. No. 218,559, Jan. 17, 1972, which is a continuation-in-part of Ser. No. 124,489, March 15, 1971, abandoned. This application July 23, 1973, Ser. No. 381,895

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 9 Claims

1. A method for treating anxiety which comprises administering to a mammal in need of said treatment a tranquilizing effective amount of a compound of the formula



where

R_1, R_2, R_3, R_4 and R_5 are independently hydrogen, or lower alkyl having 1 to 4 carbon atoms, and

Z is $-(CH_2)_n-$

where

n is 1 or 2.

3,919,429

DISPERSING AND WETTING AGENTS FOR USE IN ORGANIC BIOCIDES

Max Grossmann, Frankfurt (Main); Ruth Faber, Burgkirchen, and Heinz Uhrig, Steinbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

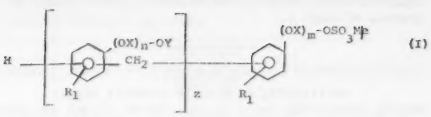
Filed Jan. 12, 1973, Ser. No. 323,307

Claims priority, application Switzerland, Jan. 18, 1972, 720/72

Int. Cl.² A01N *9/00*

U.S. Cl. 424—358 4 Claims

1. A dispersible concentrate of a water-insoluble organic biocidal substance, which comprises, as dispersing and wetting agent, a sulfuric acid semi-ester of an oxyalkylated polynuclear alkylphenol of the formula I



in which —(OX)— stands for an oxyalkylene radical having 2 or 3 carbon atoms, R_1 is a saturated linear or branched alkyl group having 1 to about 14 carbon atoms, Y is a hydrogen atom or a radical $-SO_3Me$, Me representing hydrogen, ammonium or an alkali metal, and *n* and *m* stand for an integer of about 2 to 25 and *z* for an integer of 1 to about 9, said organic biocidal substance being a chlorinated hydrocarbon, phosphoric acid ester or carbamate, in an amount of about 20–80 percent by weight, the amount of said dispensing and wetting agent being about 0.5–8 percent by weight.

3,919,430

WATER ABSORPTION BASE

Frederick P. Siegel, Lincolnwood, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 28, 1974, Ser. No. 437,418

Int. Cl.² A61K *7/48*, *47/00*

U.S. Cl. 424—365 3 Claims

1. A water absorption base for cream and lotion cosmetic formulations, consisting essentially of:

a. from 1.5 to 10% by weight of a member of the group consisting of sorbitan monooleate and oleic acid ethoxylated with about 3 moles of ethylene oxide;

b. from 0.6 to 3.0% by weight of a member of the group consisting of glycerol monooleate and glycerol monolaurate;

c. from 0.45 to 1.5% by weight of stearyl alcohol;

d. from 0.45 to 1.5% by weight of cetyl alcohol; and

e. balance at least 75% by weight of a fiber petrolatum; said water absorption base having a capability of forming a stable water-in-oil emulsion in a ratio of 100 parts of base to at least 400 parts of water, by weight, said emulsion showing no separation when held both at 77°F and 110°F for a minimum period of 48 hours.

3,919,431

PROCESS FOR MAKING AND USING SODIUM BENZOATE-CAFFEINE COMPOSITIONS

Baxter L. Tilford, Richmond Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 18, 1973, Ser. No. 407,708

Int. Cl.² A23L *2/00*

U.S. Cl. 426—190 7 Claims

1. A process for preparing a solid, homogeneous composition consisting essentially of, on a weight basis, from about 14% to about 79% sodium benzoate, from about 20% to about 85% caffeine and up to about 1.0% water comprising forming a solution of the sodium benzoate and the caffeine and then drying the solution.

5. In a process for preparing beverages that contain sodium benzoate and caffeine; the improvement wherein the sodium benzoate and caffeine are introduced into the beverage form-

ing process as the composition which is the product of the process of claim 1.

3,919,432

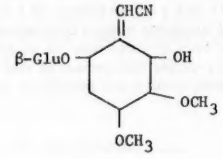
DETOXIFICATION OF JOJOBA MEAL

Carl A. Elliger, Berkeley; Anthony C. Waiss, Jr., Pinole, and Albert N. Booth, Berkeley, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 498,163
Int. Cl.² A23B *9/00*
U.S. Cl. 426—319 **1 Claim**

1. A process for reducing the toxicity of jojoba meal which is contaminated with the sole toxic compound

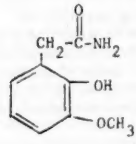
(I)



which comprises

applying to the meal 5 to 10% of ammonia based on the weight of the meal and 20 to 25% of water based on the weight of the meal, and

holding the so-treated meal for a period of 25 to 35 days in a gas-tight container whereby to promote rearrangement of said Compound I into the compound



3,919,433

PROCESS FOR RECOVERING LIVESTOCK FOOD FROM CATTLE EXCRETA WASTE

Franklin C. Senior, Phoenix, Ariz., assignor to Feed Recycling Co., Brawley, Calif.

Filed June 14, 1974, Ser. No. 479,192
Int. Cl.² A23K *1/18*
U.S. Cl. 426—320 **3 Claims**

1. A process for recovering livestock food from cattle excreta waste which comprises the steps of, in the order stated: mixing said excreta waste with a recycle brine solution in the ratio ranging from 12–14 to 1 of said brine solution to excreta waste to form a slurry including solid portions;

mechanically separating said brine solution and said solid portions of the slurry from ash components in the slurry; flocculating a first solid coagulable constituent from said brine solution, utilizing a protein coagulant;

centrifuging said coagulable constituent from said brine solution in a range of 400 to 800 times gravity field;

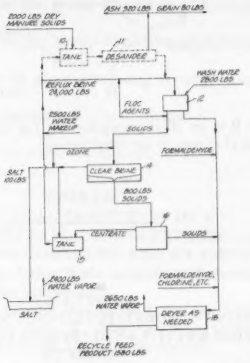
treating the aforesaid brine solution with gaseous ozone and a protein coagulant;

settling the aforesaid brine solution to provide a second solid coagulable constituent;

centrifuging the second solid coagulable constituent in the range of 800 to 1200 times gravity field;

mixing the centrifuged second solid coagulable constituent with said first coagulable constituent, providing a damp livestock food;

adding a volatile sterilizing agent to the combined livestock food, and drying said livestock food; and



removing a selected fraction of solution from aforesaid brine solution and adding an equivalent volume of water, providing a recycle brine solution.

3,919,434

SHORTENING SPARING PROCESS FOR CHEMICALLY LEAVENED BAKED AND FRIED PRODUCTS AND COMPOSITIONS FOR PREPARING THE SAME

Cho C. Tsen, and William J. Hoover, both of Manhattan, Kans., assignors to The Kansas University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 78,237, Oct. 5, 1970, Pat. No. 3,773,521. This application Nov. 9, 1973, Ser. No. 414,234The portion of the term of this patent subsequent to Oct. 20, 1990, has been disclaimed.
Int. Cl.² A21D *10/04, 10/00, 2/16, 2/26*
U.S. Cl. 426—553 **12 Claims**

7. In a wheat flour based, chemically leavened dough or batter composition wherein an amount of shortening is present in the composition to impart particular organoleptic properties to baked or fried goods derived therefrom, the improved dough or batter composition which comprises:

an admixture of wheat flour and shortening and other ingredients necessary for said chemically leavened dough or batter composition, the quantity of shortening present in the latter being from 12½ to about 35% less than the amount of shortening employed to give said derived baked or fried products said particular organoleptic properties; and

from about 0.1 to 3% (baker's weight) of an additive selected from the group consisting of the sodium and calcium salts of the acyl lactylates of C_{14}–C_{22} fatty acids,

the amount of said additive present in said dough or batter being sufficient to maintain said particular organoleptic properties of said derived baked or fried goods at levels substantially equal to or exceeding those of baked or fried goods derived from an otherwise identical dough or batter containing said amount of shortening and being essentially free of said additive.

3,919,435

MEAT ANALOG SYSTEM

Alonzo H. R. Feldbrugge, New York, N.Y.; Marshall M. Rankowitz, Bronx, N.Y., and Arno Huste, Rego Park, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 114,720, Feb. 11, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,496
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A23J *3/00;* **A23L** *1/04*
U.S. Cl. 426—574 **8 Claims**

1. A process for producing a food product which re-

sembles meat products made from meat emulsions comprising:

a. contacting a polymeric carbohydrate gel precursor with a material selected from the group consisting of non-rendered animal fat, rendered animal fat, vegetable oil, and combinations thereof and gelling said gel precursor to substantially encapsulate said material;

b. forming a uniform mixture of:

1. a protein gel precursor consisting of a vegetable proteinaceous material and a material selected from the group consisting of albumen, casein, whey, and mixtures thereof, said vegetable proteinaceous material having a vegetable protein content of above about 30% by weight and wherein the minimum weight ratio of the vegetable protein to albumen, casein or whey is about 3.4:1, 5:3, and 1:1, respectively, or a weighted ratio for mixtures thereof and wherein the maximum weight ratio of vegetable protein to albumen, casein, whey or mixtures thereof is about 40:1,

2. water in an amount in the range of to about 74% by weight of the mixture, and

3. the substantially encapsulated material of a) in an amount in the range of from about 5 to about 30% by weight of the mixture;

c. shaping said uniform mixture to a desirable form; and

d. heating the shaped mixture to set the protein gel precursor to a stable, physical form.

3,919,436

PROCESS FOR PREPARATION OF COATED MEDICINES

Toshio Takebe, Omiya; Tadashi Zenbutsu, Seda; Kinji Omata; Hiroya Mogi, both of Tokyo, and Yoshitaka Taniguchi, Mitaka, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1972, Ser. No. 291,982

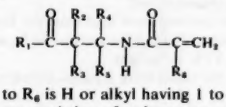
Claims priority, application Japan, Sept. 27, 1971, 46-75182; Aug. 30, 1972, 47-86847

Int. Cl.² A61K *9/32*

U.S. Cl. 427—3 **9 Claims**

1. A process for forming film coatings on the surfaces of a plurality of solid, shaped, pharmaceutical medicated tablets or granules, which comprises the steps of: spraying onto said tablets or granules a liquid coating composition made up of a coating agent dissolved in a volatile organic solvent to form a surface film coating on said tablets or granules, said coating agent consisting essentially of a polymer selected from the group consisting of

a. homopolymer of a monomer of the formula



wherein R_1 to R_6 is H or alkyl having 1 to 6 carbon atoms;

b. polymers consisting of at least two monomers of said formula;

c. polymers consisting of more than 10 mole percent of at least one monomer of said formula and the balance being at least one comonomer selected from the group consisting of alkyl (C_1 –C_4) esters of acrylic acid, methacrylic acid, itaconic acid or maleic acid, acrylonitrile, styrene, substituted styrenes, vinyl acetate, vinyl chloride, vinyl ethers, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, acrylamide, methacrylamide, acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid, acrylic acid ester of polyethyleneglycol butyl ether, acrylic acid ester of polypropyleneglycol butyl ether, acrylic acid ester of polyethyleneglycol ethyl ether, methacrylic acid ester of polypropyleneglycol butyl ether, methacrylic acid ester of polypropyleneglycol propyl ether, acrylic acid ester of polyethylene-polypropyleneglycol butyl ether and crotonic acid ester of polyethylene-polypropyleneglycol butyl ether, and drying the thus-coated tablets or granules.

3,919,437

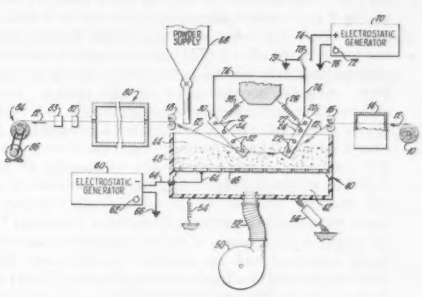
METHOD FOR ELECTROSTATICALLY IMPREGNATING STRAND

Alfred W. Brown, Woonsocket, R.I., and Richard J. Moran, Norton, Mass., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 227,958, Feb. 22, 1972, Pat. No. 3,817,211. This application Jan. 16, 1974, Ser. No. 433,932

Int. Cl.² B05B *5/02;* **B44D** *1/92, 1/95*

U.S. Cl. 427—13 **25 Claims**



1. A method for impregnating a non-conductive strand made up of a plurality of non-conductive filaments, comprising the steps of:

a. providing a fluid suspension of particulate impregnating material,

b. electrostatically charging the particles of said material with charges of like polarity,

c. treating the surfaces of said non-conductive filaments to moisten said filament surfaces so they are at least semi-conductive,

d. opening said multi-filament strand and separating the plurality of moistened strand filaments from each other by electrostatically charging the individual moistened filament surfaces with like charges to cause said filaments to repel each other, said filament charges being opposite in polarity to the charges on said impregnant material particles, and

e. guiding the separated filaments of said strand into said suspended particulate material enabling the oppositely charged particles to be collected on said separated individual filaments.

3,919,438

METHOD OF COATING USING A SILICONE MODIFIED POLYESTER

M. P. Urkevich, McVille, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 225,300, Feb. 10, 1972. This application Nov. 15, 1972, Ser. No. 306,609

Int. Cl.² B05D *3/06;* **C08F** *267/06*

U.S. Cl. 427—54 **6 Claims**

1. A method of coating a substrate which comprises applying to said substrate a film, said film comprising (i) a copolymer composition comprising the reaction product of:

A. a hydroxyl terminated unsaturated polyester of:

1. polycarboxylic acid reactant wherein at least about 65 mole percent of said polycarboxylic acid reactant is an α,β-ethylenically unsaturated polycarboxylic reactant and up to about 35 mole percent of said polycarboxylic acid reactant is a polycarboxylic acid reactant free from non-benzenoid unsaturation; and

2. an alcohol reactant containing two terminal hydroxyl groups and a member selected from the group consisting of allyl ether groups methallyl ether groups and

mixtures thereof in an amount sufficient to provide at least 0.1 mole of said ether groups per mole of said ethylenically unsaturated polycarboxylic acid reactant; and

3. wherein said polyester has an acid number from about 10 to about 35; and

B. an organopolysiloxane having the average unit formula:

$$(OH)_q(OR')_rR_sSiO_{\frac{4-q-r-s}{2}}$$

wherein R is selected from the group of lower alkyl radicals having 1 to 8 carbon atoms; cycloalkyl radicals having 5 to 7 carbon atoms in the ring; lower alkenyl radicals having 2 to 8 carbon atoms; mononuclear aryl radicals; mononuclear aryl lower alkyl radicals having 1 to 6 carbon atoms in the alkyl group; and halogenated derivatives of the above radicals; R' is selected from the group of alkyl radicals containing 1 to 8 carbon atoms; mononuclear aryl radicals; acyl radicals of 1 to 8 carbon atoms; s has a value of 1.0 to 2.0; q has a value of 0 to 1.0; r has a value of 0 to 1.0; the sum of $q+r$ has a value of 0.01 1.0; and said organopolysiloxane containing at least 0.25% by weight of OH or OR' groups or a mixture of said OH and OR' groups; (ii) an ethylenically unsaturated liquid monomer in an amount from about 5 to about 75% by weight of the mixture of the ethylenically unsaturated liquid monomer and the reaction product; and (iii) a catalytic amount of a free-radical type catalyst; and polymerizing the reaction product and the ethylenically unsaturated liquid monomer.

3,919,439
METHOD OF APPLICATION OF THPOH-NH_3 FIRE RETARDANT FINISH TO TEXTILES

Rita M. Perkins; Albert S. Cooper, Jr.; Timothy A. Calamari, Jr., all of Metairie; Harry B. Moore, New Orleans, and Sidney P. Schreiber, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 10, 1974, Ser. No. 468,952
Int. Cl.² B44D *1/44;* **D06M** *13/28, 13/44*
U.S. Cl. 427—341 **1 Claim**

1. In a process for imparting flame retardance to fibrous cellulosic textiles which process comprises (a) impregnating the textile with monomeric tris(hydroxymethyl)phosphine hydroxide, (b) drying the impregnated textile and (c) exposing the dry textile to gaseous ammonia and allowing the ammonia to react with the tris(hydroxymethyl)phosphine hydroxide, the improvement comprising performing step (c) at a temperature of about from 65° to 95° C.

3,919,440
SHATTERPROOF GLASS BOTTLE

Akikazu Takahashi, Matsudo; Yuji Futatsugi, Chiba; Takamu Yao, Narashino, and Yoichi Higashide, Chiba, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

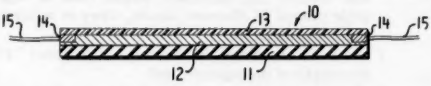
Filed Mar. 18, 1974, Ser. No. 452,330
Int. Cl.² B44D *1/14;* **C03C** *17/32*
U.S. Cl. 428—35 **6 Claims**

1. A glass bottle in which shattering or scattering of broken glass pieces is prevented at the time of the breakage of the bottle, said bottle being obtained by forming a rubber coating to a dried thickness of 50 – 300 microns on the outer surface of a bottle by application of an aqueous latex of a copolymer comprising (1) 25 – 70% by weight of butadiene, (2) 0.5 – 10% by weight of a monoethylenically unsaturated carboxylic acid and (3) 20 – 74.5% by weight of at least one vinyl compound selected from the group consisting of styrene, alpha-methylstyrene, methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, 2-ethylhexyl acrylate, 2-ethylhexyl methacrylate, octyl acrylate, octyl methacrylate, beta-hydroxyethyl acrylate, beta-hydroxyethyl methacrylate, beta-hydroxypropyl acrylate, beta-hydroxypropyl methacrylate, glycidyl acrylate, glycidyl methacrylate, vinyl chloride, vinylidene chloride, divinylbenzene, acrylamide, methacrylamide, N-methylolacrylamide, N-methylolmethacrylamide, vinyl pyridine, acrylonitrile and methacrylonitrile.

3,919,441
PANEL-STYLED CALORIFIC DEVICES AND A PROCESS FOR MANUFACTURING THE SAME

Seinosuke Horiki, 57-134 Horagai, Narumi, Midori, Nagoya, Japan

Filed Dec. 20, 1973, Ser. No. 426,596
Claims priority, application Japan, Dec. 20, 1972, 47-147139; Dec. 26, 1972, 47-1831; Apr. 15, 1973, 48-42541
Int. Cl.² B32B *17/06;* **B44D** *1/18, 1/16*
U.S. Cl. 428—426 **8 Claims**



1. A panel-styled calorific device which comprises:

a. a substrate

b. a layer of calorific material prepared by mixing

1. glass powder

2. a metal powder selected from the group consisting of copper, silver, gold, zinc, cadmium, aluminum, indium, thallium, tin, lead, antimony and bismuth, and

3. a synthetic oil comprising an organic solvent and at least one synthetic resin selected from the group consisting of acryl resins, methacrylic resins, vinyl acetate resins, styrol resins, vinyl ether resins, vinyl chloride resins, vinylidene chloride resins, vinyl pyrrolidone resins, polyethylene, polypropylene, polyvinyl alcohol, acetal resins, butyral resins, phenol resins, alkyol resins, melamine resins, polyamide resins, polyurethane resins, methylcellulose, hydroxyethyl cellulose, carboxymethyl cellulose, ethyl cellulose, cellulose nitrate, cellulose acetate, cellulose butyrate, styrene butadiene rubbers, acrylonitrile-butadiene rubber, isoprene rubber, butyl rubber, polybutadiene rubber, polychloroprene rubber, ethylene-propylene rubber, thiokol rubber, natural rubber and reclaimed rubbers thereof, petroleum resins, cumarone resins, terpeno resins, rosin and derivatives thereof, starch, denatured starch, proteins and denatured proteins, and firing the mixture at a temperature above the melting point of sand metal powder thereby partially oxidizing said metal powder on said substrate, and

c. a protective coating over said calorific layer, said metal powder being present in the mixture in an amount ranging from 97 to 27% by weight.

4. A method for fabricating a panel-styled calorific device which comprises:

a. coating a substrate with a paste comprising a mixture of a glass powder, a metal powder selected from the group consisting of copper, zinc, silver, gold, cadmium, chromium, indium, thallium, tin, lead, antimony and bismuth, and a synthetic oil comprising an organic solvent and at least one synthetic resin selected from the group consisting of acryl resins, methacrylic resins, vinyl acetate resins, styrol resins, vinyl ether resins, vinyl chloride resins, vinylidene chloride resins, vinyl pyrrolidone resins, polyethylene, polypropylene, polyvinyl alcohol, acetal resins, butyral resins, phenol resins, alkyol resins, melamine resins, polyamide resins, polyurethane resins, methylcellulose, hydroxyethyl cellulose, carboxymethyl cellulose, ethyl cellulose, cellulose nitrate, cellulose acetate, cellulose butyrate, styrene butadiene rubbers, acrylonitrilebutadiene rubber, isoprene rubber, butyl rubber, polybutadiene rubber, polychloroprene rubber, ethylene-propylene rubber, thiokol rubber, natural rubber and

reclaimed rubbers thereof, petroleum resins, cumarone resins, terpeno resins, rosin and derivatives thereof, starch, denatured starch, proteins and denatured proteins,

b. firing the mixture at a temperature above the melting point of said metal powder thereby partially oxidizing said metal powder on said substrate, and

c. coating the fired mixture of step (b) with a protective material

said metal powder being present in said mixture in an amount of from 86 to 27% by weight.

3,919,442
RUBBER ARTICLES HAVING IMPROVED SLIP COATING

Pascal E. Esemplare, Mountainside, N.J., and Dennis Beeferman, Brooklyn, N.Y., assignors to Sutures, Inc., Coventry, Conn.

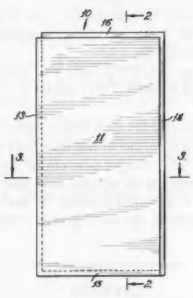
Filed Oct. 12, 1973, Ser. No. 405,863
Int. Cl.² B32B *25/08, 25/12, 27/00;* **A41D** *19/00*
U.S. Cl. 428—494 **8 Claims**

1. An article comprising a rubber surface provided with an essentially rubber-free extensible adherent slip coating, said slip coating being essentially rubber free and comprising from 5 to 90 percent by weight of a first resin copolymer component selected from the group consisting of vinyl chloride-alkyl acrylate copolymer, vinylidene chloride-alkyl acrylate copolymer, and vinyl acetate-alkyl acrylate copolymer, and correspondingly, from 95 to 10 percent by weight of a second resin copolymer component selected from the group consisting of vinyl chloride-vinyl ester copolymer, and vinylidene chloride-vinyl ester copolymer.

3,919,443
CONSTRUCTION PANEL HAVING OVERLAPPING EDGES AND FOAM BACKING

William H. Porter, Holland, Mich., assignor to W. H. Porter, Inc., Holland, Mich.

Continuation-in-part of Ser. No. 367,113, June 5, 1973, abandoned, which is a continuation of Ser. No. 159,295, July 2, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,178
Int. Cl.² B32B *3/02, 5/18;* **E04C** *1/30, 2/38*
U.S. Cl. 428—81 **12 Claims**



1. A prefabricated panel of substantially uniform width and thickness, adapted to be adhesively affixed to a supporting surface and to interlock with an adjacent panel of the same type, comprising

a foamed sheet of a plastic material;

a rigid facing sheet bonded to the foamed sheet on one side thereof leaving one surface of the foamed sheet exposed;

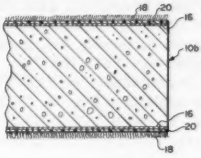
an integral, sheet-form planar flange member along one edge of the facing sheet and extending beyond the foremost underlying edge of the foamed sheet and having its surfaces coplanar with the surfaces of said facing sheet; and

an integral, debossed flange member along a facing sheet edge substantially parallel to said planar flange member extending beyond the formost underlying edge of the foamed sheet, the depth of debossment of said debossed flange member being sufficient to accept the thickness of said coplanar flange, whereby said planar flange member overlaps a debossed flange member of an adjacent panel of the same type and engages only the outer surface of said debossed flange when adjacent panels are interlocked.

3,919,444
ACOUSTICAL FIRE-RETARDANT WALL AND CEILING TILE

Harry I. Shayman, 777 N. Michigan Ave., Chicago, Ill. 60611

Filed Apr. 29, 1974, Ser. No. 465,244
Int. Cl.² B32B *5/08*
U.S. Cl. 428—95 **12 Claims**



1. A laminated rigid construction panel comprising:

a rigid foamed plastic body structure;

an outer layer of tufted carpet material; and

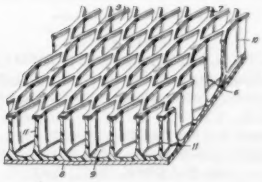
an intermediate resinous vinyl layer of binding material bonded between said rigid foamed, plastic body and said layer of tufted carpet material;

said body structure comprising the sole unifying and rigidifying means for said layers to form said rigid construction panel.

3,919,445
PROCESS FOR FORMING EXPANDED LAMINATES AND PRODUCTS

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,361, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,502
Int. Cl.² B29C *17/02;* **B32B** *3/12*
U.S. Cl. 428—116 **24 Claims**



1. A process for preparing a laminate from a thermoformable material having a Ta and a pair of mold plates having a Ta higher than that of said thermoformable material which comprises

positioning said thermoformable material between said mold plates while said thermoformable material is heated to a temperature which is ≥ the Ta of said thermoformable material and at which temperature said thermoformable material is in a thermoformable state

adhesively bonding said thermoformable material by hot tack adhesion to said mold plates

pulling said mold plates apart, while said thermoformable material is thus adhesively bonded thereto and is in said thermoformable state, so as to thereby expand the cross section of said thermoformable material and effect within said expanding thermoformable material one or more voids having a partial vacuum therein,

venting said voids during said pulling apart so as to equilibrate the lower level of pressure within said voids with the higher level of ambient pressure without said thermoformable material and thereby regulate the uniformity and integrity of the geometry of the resulting expanded cross section of said thermoformable material, and

cooling the expanded thermoformable material to a temperature below the heat distortion point of said thermoformable material,

so as to thereby form a laminate of the expanded thermoformable material with at least one of said mold plates.

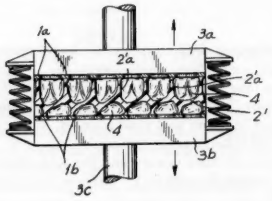
3,919,446
PROCESS FOR EXPANDING THERMOFORMABLE MATERIALS AND PRODUCTS

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 213,702, Dec. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,624

Int. Cl.² B29C *17/02;* **B32B** *3/12*

U.S. Cl. 428—116 **80 Claims**



1. A process for expanding the cross section of a blank of thermoformable material, while it is in a thermoformable state, with the attendant formation of one or more voids having a partial vacuum therein within said cross section which comprises venting said voids during the increasing of the cross section so as to equilibrate the lower level of pressure within said voids with the higher level of ambient pressure without said blank and thereby regulate the uniformity and integrity of the resulting cross-sectional geometry of the expanded blank.

80. A product made by the process of claim **1.**

3,919,447
SPECTRAL DIFFERENTIAL CODED CARD

Charlie C. Kilmer, Jr., and George J. Laurer, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 213,201, Dec. 28, 1971, abandoned. This application Mar. 20, 1974, Ser. No. 453,138

Int. Cl.² G06K *19/02, 7/12*

U.S. Cl. 428—138 **7 Claims**

1. A card or the like suitable for use in personal and item identification comprising:

a first film having an optical bandpass transmission free from sharp band absorption characteristics in a predetermined non-visible light wave region; and

a selectively apertured second film laminated upon the first film and having a substantially similar spectral response as that of the first film within the predetermined non-visible light wave region of the first film bandpass but for a sharp band absorption characteristic at a near single frequency, the laminate including the apertured portions thereof further exhibiting a substantially uniform transmissivity and surface reflectance in the visible light wave region.

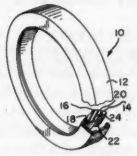
3,919,448
MODIFIED ELASTOMERIC COMPOSITIONS, METHOD AND OIL SEALS MADE THEREFROM

Eugene R. Dufresne, Glen Ellyn, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation of Ser. No. 179,717, Sept. 13, 1971, abandoned. This application July 30, 1973, Ser. No. 383,702

Int. Cl.² B32B *3/02;* **C08K** *5/06*

U.S. Cl. 428—157 **7 Claims**



1. An oil seal unit comprising a relatively rigid mounting portion and a flexible body portion having a lip adapted to engage a part to be sealed, said lip being formed from a modified, oil resistant cured acrylate elastomeric composition having, in relation to otherwise similar but unmodified acrylate rubber compositions, substantially greater low temperature flexibility and substantially unchanged resistance to attack by hot air and hot oil, said modified composition comprising a cured polymer of an acrylate material and including therein up to about 25% of a modifying material comprised of an aliphatic polyether composition, said modifying material further having terminal hydroxyl groups, having at least a substantial portion of lower alkyl side groups, and having a molecular weight of from at least 1,000 up to about 12,000.

3,919,449
ACID-MODIFIED POLY(VINYL ACETATE) TEXTILE SIZES

Albert E. Corey, East Longmeadow, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,508

Int. Cl.² B05D *3/02;* **D03D** *25/00*

U.S. Cl. 428—245 **12 Claims**

1. A method for sizing textiles which comprises applying to the textile material a solution of the interpolymerization product of from 90.5 to 95.5 weight percent of vinyl acetate, from 4.0 to 7.5 weight percent of acrylic acid and from 0.5 to 2.0 weight percent of a monoalkyl ester of maleic, fumaric, or citraconic acids in which the alkyl group contains from 1 to 8 carbon atoms.

3,919,450
COLOR DEVELOPING HIGH IMPACT POLYSTYRENE SHEET AND METHOD OF DEVELOPING COLOR IMAGES INSIDE THE SAME

Takuji Shimizu, Yokohama; Isao Ohara, and Kenji Yasuda, both of Tokyo, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed June 19, 1973, Ser. No. 371,395

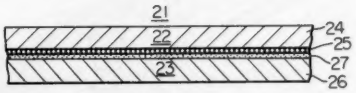
Claims priority, application Japan, June 24, 1972, 47-62829

Int. Cl.² B32B *3/26, 5/18;* **B41L** *1/00*

U.S. Cl. 428—307 **18 Claims**

1. A color developing high impact polystyrene sheet comprising:

1. a substrate layer consisting essentially of a high impact polystyrene film which has fine particles of a rubber component uniformly dispersed in the polystyrene and which has been stretched in at least one direction,
2. at least one paper-like rough surface layer provided on said substrate layer and having therewithin numerous microvoids, said microvoids being formed by treating the



surface portion of the high impact polystyrene film with an organic liquid capable of dissolving or swelling the polystyrene and capable of allowing the stretched particles of said rubber component to rapdily shrink, and

3. an acid color developing agent contained in said microvoids, said acid color developing agent being capable of developing acid-reactive colorless color forming dye.

3,919,451

METHOD FOR FINISHING LEATHER AND LEATHER SUBSTITUTES

Jerome F. Levy, Dresher; Hugo A. Alps, Huntingdon Valley; Michael L. Alderman, Broomall, and David A. Templer, Huntingdon Valley, all of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed July 9, 1973, Ser. No. 377,885
Int. Cl.[2] C14C *11/00*
U.S. Cl. 428—310 **23 Claims**

1. A process for preparing finished leather and leather substitutes which comprises:

a. Applying a coating of a polymeric acrylic latex containing a blowing agent, to leather or leather substitutes which coating is foamed on the substrates by said blowing agent selected from, 1) a solvent having a boiling point in the range of from −50° to 220°F. in which the uncrosslinked polymer exhibits a swell ratio in the range from 1 to about 7 or 2) a chemical blowing agent;

b. Drying and foaming the latex coated substrate at a temperature in the range of from about 120° to about 400°F.;

c. Crushing, embossing and curing the coated substrate at a pressure in the range of from about 5 to about 2500 psi at a temperature in the range of from about 150° to about 400°F., and

d. Applying a finish coat to the crushed foam coated substrate.

3,919,452

PRECISION BONDING SYSTEM

Kitty S. Ettre, Norwalk, Conn.; George Richard Castles, Fitzwilliam, N.H., and Aloyzas Petrikas, Wilton, Conn., assignors to Vitta Corporation, Wilton, Conn.

Filed Oct. 23, 1973, Ser. No. 408,501
Int. Cl.[2] B32B *17/06, 3/02, 7/14*
U.S. Cl. 428—325 **13 Claims**

1. A sealing system for intimately bonding two members, with a precisely spaced separation gap comprising:

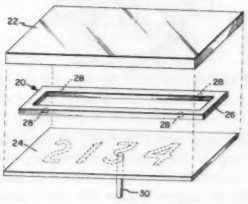
A. sealing cement disposed between said two members about the sealing areas thereof, and

B. at least three spacers disposed within said sealing cement, for maintaining a precise separation gap between said members when said cement is cured.

9. A sealing system for intimately bonding two members of a gas discharge device with a precisely spaced separation gap in which an interior area of the gas discharge device must not have any sealing cement therein, comprising:

A. a pre-formed, transfer tape layer of sealing cement of uniform thickness formed in the shape of a closed frame defining an open area in the center thereof, said closed frame substantially conforming to the sealing areas of said gas discharge device, and

B. at least three uniformly sized and shaped spacers disposed within said transfer tape layer all of said spacers comprising substantially identical dimensions in the direction corresponding to the thickness of the transfer



tape layer which is smaller than the thickness of the transfer tape layer.

10. A sealing system for intimately bonding liquid crystals devices with a precise separation gap therebetween comprising:

A. a pre-formed transfer tape layer of sealing cement of uniform thickness formed in the shape of a closed frame defining an open area in the center thereof, said closed frame substantially conforming to the sealing areas of said liquid crystals, and

B. at least three uniformly sized and shaped spacers disposed within said transfer tape layer all of said spacers comprising substantially identical dimensions in the direction corresponding to the thickness of the transfer tape layer said dimension being smaller than the thickness of the transfer tape layer.

3,919,453

CORROSION RESISTANT COATED METAL

George W. Bussell, Dearborn, Mich., assignor to Inmont Corporation, New York, N.Y.

Division of Ser. No. 179,168, Sept. 9, 1971, abandoned. This application Mar. 20, 1973, Ser. No. 343,136
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B32B *15/08;* **C09D** *5/08;* **C23B** *13/00*
U.S. Cl. 428—336 **5 Claims**

1. An article of manufacture consisting of a metal object having a corrosion resistant 0.4 to 0.5 mil thick coating of heat cured resin consisting essentially of the heat reaction product of a mixture consisting of 15 to 20 percent maleic anhydride and 85 to 80 percent of a synthetic oil containing alicyclic rings consisting of the esterification product of one mole 9-oxatetracyclo-4.4.$1^{2,5}$.$O^{1,6}$.$O^{8,10}$ undecan-4-ol with three moles of unsaturated long chain fatty acid.

ELECTRICAL

3,919,454
MELTING ARRANGEMENT, PARTICULARLY FOR USE IN THE CONTINUOUS PRODUCTION OF STEEL

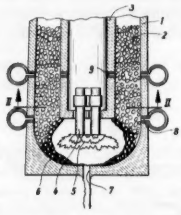
Hans Jürgen Langhammer, Bremen-Platjenwerbe, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Aug. 26, 1974, Ser. No. 500,661

Claims priority, application Germany, Aug. 25, 1973, 2342959

Int. Cl.² H05B 7/10

U.S. Cl. 13—9 **16 Claims**



1. An arrangement for melting charges, comprising wall means defining a substantially vertically oriented melting chamber for accommodating a column of charge, said chamber including an upper region for the introduction of said charge therein and a lower region for melting the leading end of said column; electrode means having an arc-generating end for effecting melting of said leading end; and a support member for said electrode means having an end section which is arranged to be located adjacent said lower region during melting of said leading end, said support member supporting said electrode means in such a manner as to permit an arc from said arc-generating end to melt said leading end while said electrode means is maintained substantially free of contact with said column above said end section of said support member.

3,919,455
APPARATUS FOR THE MEASUREMENT OF THE VOLUME AND FLOW RATE OF LIQUIDS

Jan-Erik Sigdell, and Martin Buser, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

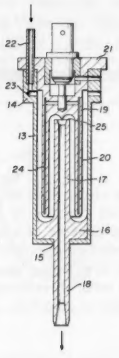
Continuation of Ser. No. 307,249, Nov. 16, 1972, abandoned. This application July 22, 1974, Ser. No. 490,465

Claims priority, application Switzerland, Oct. 20, 1972, 15418/72

Int. Cl.² G01F 3/38

U.S. Cl. 73—226 **1 Claim**

1. In apparatus for the measurement of the volume and flow rate of a flowing liquid which includes a syphon arrangement adapted to operate on the syphon-suction principle, a container for the collection and discharge of the flowing liquid and a discharge orifice, the arrangement comprising a housing being open at one end and having a reduced opening at the other end thereof, and first and second closely cooperating members of cylindrical symmetry securely received within said housing, said first member being formed of a central portion with first and second extensions thereto of narrower cross-section, defining with said central portion a conduit through said first member along the longitudinal axis thereof, said conduit having first and second orifices at the respective free ends of said extensions, the first extension of said first member protruding through the reduced opening of said housing to define said discharge orifice, said second member of cylindrical symmetry being substantially in the form of a hollow cylinder opened at one end for receiving into the interior thereof the second extension of said first member, the shape of said first and second cooperating members and the arrangement thereof within said housing being such as to define from the open end of said housing to said discharge orifice a continuous path for liquid flow which includes said syphon arrangement and said container, said apparatus further comprising sensing means predeterminably arranged relative to said continuous path for detecting the presence of liquid, said container having an electrically conducting wall forming a first element of a capacitor device for measuring the liquid level in the container and one of said members of cylindrical symmetry containing an electrically conducting layer forming a second element of said capacitor device.



3,919,456
TUBE ENCLOSED PRESSURE GAS INSULATED ELECTRICAL CABLE

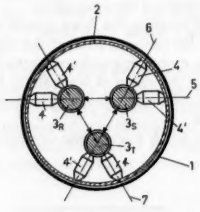
Carl Dieter Floessel, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 16, 1974, Ser. No. 515,157

Claims priority, application Switzerland, Nov. 14, 1973, 16033/73

Int. Cl.² H01B 9/06

U.S. Cl. 174—27 **2 Claims**



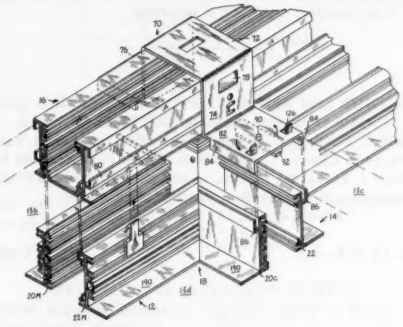
1. In a tube -enclosed pressure gas insulated cable having a three-phase conductor configuration within a common circular tubular enclosure, the respective axes of the phase conductors being located at the apices of a triangle and fixed separately to a supporting ring by means of pin-type insulators, the improvement wherein a pair of pin-type insulators extend divergently outward from each phase conductor to said supporting ring and are so positioned that the respective axes of the two pins forming the insulator support for each phase conductor pass through the center of the conductor and are aligned with the axes of pins forming the respective insulator supports for the other two phase conductors.

3,919,457

ELECTRIFIED SUSPENSION CEILING SYSTEM

Sheldon Steiner, 184-61 Tudor Road, Jamaica, L. I., N.Y.

Filed Apr. 22, 1974, Ser. No. 462,861
Int. Cl.² H02G 3/04
U.S. Cl. 174—48 16 Claims



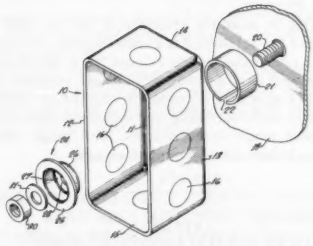
1. A suspension ceiling system including: a plurality of track members; each of said track members having generally parallel opposed side walls; guide means spaced apart from and co-extensive with at least one of said side walls; electrical cable means co-extensive with and retained in position between said one side wall and said guide means; and, air diffuser support means secured to the top of said side walls, said support means including a base member spanning the space between said opposed side walls, an opening in said base member and spaced side members extending upwardly from said base member, said side member defining therebetween a channel to receive an air diffuser.

3,919,458

ELECTRICAL BOX MOUNTING ARRANGEMENT

Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 23441 Batey Ave., Harbor City, Calif. 90710

Filed Dec. 13, 1973, Ser. No. 424,415
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H02G 3/10
U.S. Cl. 174—51 11 Claims



1. In combination with a support structure, an electrical box assembly comprising

a box adapted to receive electrical components,

said box having an inner wall and additional walls extending from said inner wall,

said inner wall having an opening therethrough,

a first threaded element,

a second threaded element,

said first threaded element being attached to said support structure,

a spacer adjacent said first threaded element,

one end of said spacer engaging said support structure and the opposite end of said spacer engaging the outside surface of said inner wall of said box,

and a member having

a first portion engaging the inside surface of said inner wall,

and a second portion extending from said first portion through said opening in said inner wall,

said second portion having an opening therethrough receiving one of said threaded elements,

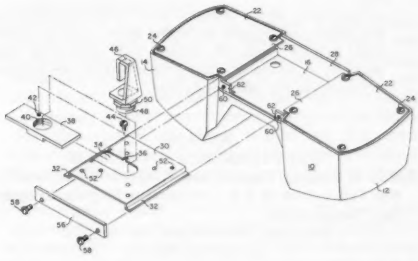
said second threaded element being meshed with said first threaded element and engaging said second portion of said member for exerting a force on said member to clamp said inner wall between said spacer and said first portion of said member, and to force said spacer against said structure for thereby securing said box to said structure.

3,919,459

LUMINAIRE BALLAST MOUNTING SYSTEM

Frank Van Steenhoven, Peninsula, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1975, Ser. No. 546,959
Int. Cl.² H02B 1/10; F21S 1/10
U.S. Cl. 174—63 10 Claims



5. A luminaire ballast housing including mounting means therefor, comprising:

an elongated open topped ballast receiving housing having a reduced sidewall height on one side of the central portion thereof,

a cover plate overlying and secured to opposite end portions of said elongated open topped ballast receiving housing, spaced one from the other, the inner edge of each of said spaced cover plates extending into said central portion defined by said reduced sidewall height,

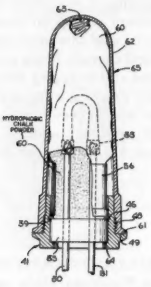
a mounting plate having a pair of depressed parallel support runners on each side edge thereof, said support runners underlying said inner edges of each of said cover plates and supporting said ballast housing while the remainder of said mounting plate overlies and closes off said central portion of said open topped ballast housing; and

means located centrally of said mounting plate for mounting said ballast housing.

3,919,460
MOISTURE PROOF CABLE SPLICE EMPLOYING HYDROPHOBIC POWDER

William R. Neail, Santa Susana, and Clifford A. Rahm, Sylmar, both of Calif., assignors to Perkins Research & Mfg. Co., Canoga Park, Calif.

Filed Aug. 20, 1973, Ser. No. 389,560
Int. Cl.[2] H02G 15/08
U.S. Cl. 174—87 9 Claims



1. A cable splice assembly insulating and protecting a conductor within a cable from moisture or other contaminants comprising:

a. enclosing means supported by said cable and surrounding said conductor, said enclosing means defining a volume including said conductor;

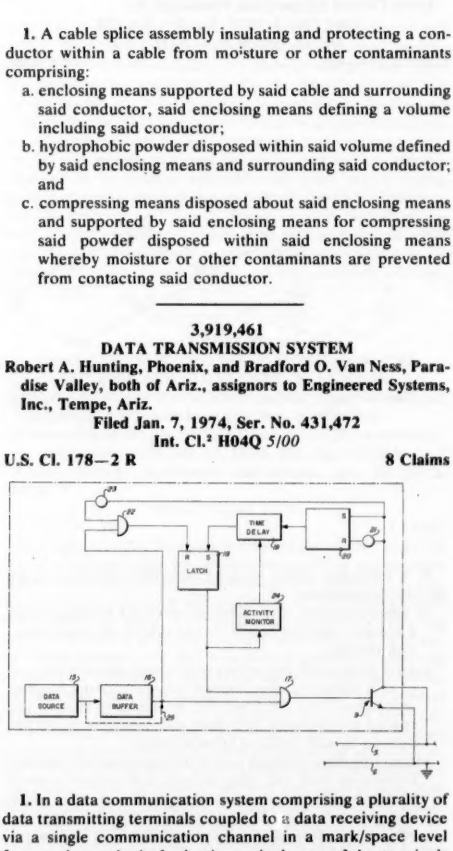
b. hydrophobic powder disposed within said volume defined by said enclosing means and surrounding said conductor; and

c. compressing means disposed about said enclosing means and supported by said enclosing means for compressing said powder disposed within said enclosing means whereby moisture or other contaminants are prevented from contacting said conductor.

3,919,461
DATA TRANSMISSION SYSTEM

Robert A. Hunting, Phoenix, and Bradford O. Van Ness, Paradise Valley, both of Ariz., assignors to Engineered Systems, Inc., Tempe, Ariz.

Filed Jan. 7, 1974, Ser. No. 431,472
Int. Cl.[2] H04Q 5/00
U.S. Cl. 178—2 R 8 Claims



1. In a data communication system comprising a plurality of data transmitting terminals coupled to a data receiving device via a single communication channel in a mark/space level format, the method of selecting a single one of the terminals for communicating a message to the data receiving device comprising the steps of:

a. establishing simultaneous access by a plurality of the terminals to the communications channel;

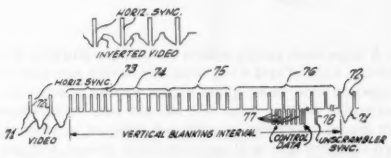
b. comparing, in each terminal, the level which that terminal attempts to impress on the communications channel and the actual level appearing on the communications channel; and

c. aborting data transmission from each terminal in which a no-compare condition is detected.

3,919,462
METHOD AND APPARATUS FOR SCRAMBLING AND UNSCRAMBLING COMMUNICATION SIGNALS

Albert F. Hartung, Woodland Hills; Frank W. Lehan, Santa Barbara; Charles T. Barooshian, Pacific Palisades, and Edward J. Zacharski, Malibu, all of Calif., assignors to System Development Corporation, Santa Monica, Calif.

Filed Aug. 15, 1973, Ser. No. 388,439
Int. Cl.[2] H04N 1/44
U.S. Cl. 178—5.1 52 Claims



1. For use with a receiver in a subscription television system, a method of unscrambling television signals transmitted in a scrambled form having selected portions containing only video information inverted according to a preselected mode from among a plurality of modes of scrambling, each mode being characterized by a sequence of alternating inverted and non-inverted groups of lines, said method comprising the steps of:

receiving the scrambled signals together with control signals and identifying codes both encoded on a common video signal carrier, the identifying codes serving to identify receivers authorized to unscramble the scrambled signals; decoding the encoded control signals and identifying codes;

comparing each of the identifying codes with one associated with the receiver;

unscrambling by selective inversion of the inverted video portions of the scrambled television signals, according to the same preselected mode as used for scrambling; and

controlling said unscrambling step, if said comparing step results in a match, in accordance with the decoded control signals, said controlling step including controlling the preselected mode in accordance with mode selection signals included with the control signals.

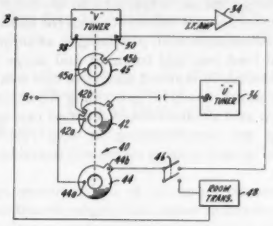
3,919,463
PAY TV SYSTEM USING UHF INPUT

Eugene C. Walding, Arlington Heights, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Apr. 25, 1974, Ser. No. 464,132
Int. Cl.[2] H04N 1/44
U.S. Cl. 178—5.1 9 Claims

1. A method of providing a subscription TV channel on the same facilities as non-subscription TV channels, including the steps of transmitting a subscription TV channel at a frequency which is the same as the output frequency of a UHF tuner,

providing a connection between the facilities and the UHF input of a TV receiver VHF tuner, and disabling the VHF



tuner oscillator while passing the subscription channel through the VHF tuner.

3,919,464

FACSIMILE TRANSMISSION SYSTEM

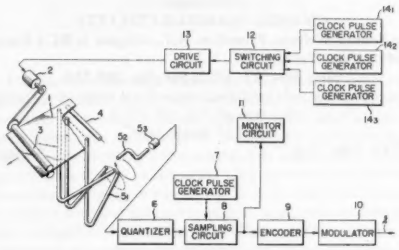
Mitsuru Kondoh, Musashino, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,793

Claims priority, application Japan, Dec. 15, 1972, 47-125878

Int. Cl.² H04N *1/32*

U.S. Cl. 178—6 **12 Claims**



12. A method of operating a facsimile system having a device for scanning a subject copy comprising the steps of

scanning a subject copy along successive scanlines to provide successive binary bits each representing the darkness of an elemental area of a scanline;

comparing successive binary bits with each other to provide a noncoincidence signal each time the compared bits are not equal; and

determining the distance along the subject copy between successive noncongruent scanlines in accordance with the number of noncoincidence signals provided during each selected time interval.

3,919,465

OPTICAL SYSTEM FOR DIRECTLY DETECTING SPATIALLY RECORDED SIGNALS

Robert Adler, Northfield, and Leonard J. Laub, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,035

Int. Cl.² G11B *11/00*; H04N *3/06*

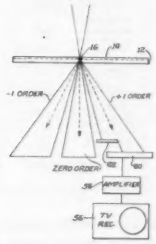
U.S. Cl. 178—6.6 R **8 Claims**

1. An optical system for directly detecting a time dependent information signal converted to a frequency modulated carrier and spatially recorded upon a record disc to form, effectively, a one dimensional light diffraction grating in the shape of an elongated spiral track, which grating includes a first spatial pattern representative of the modulated carrier signal and a second spatial pattern representative of the information signal, said optical detection system comprising:

means for supporting said record disc;

means for producing a beam of light;

means disposed adjacent said disc for receiving and focusing said beam to produce an illuminating spot, said means having a numerical aperture that establishes a predetermined dimension for said spot so that said spot, so dimensioned, is restricted to resolving only portions of said second spatial pattern corresponding to frequencies in said information signal, and, said dimensioned spot being incapable of resolving any portion of said first spatial pattern corresponding to any instantaneous frequency of the modulated carrier, so that illumination of said track by said dimensioned spot produces a diffraction pattern of said beam in which the angular displacement of a first order component of said diffracted beam, from a reference position, is established by that portion of said second



spatial pattern recorded upon the illuminated segment of the track and is representative of an instantaneous value of said information signal;

drive means for rotating said disc, relative to said dimensioned illuminating spot, at a predetermined velocity and for simultaneously effecting a progression of said focusing means normal to said spiral track, to effect a scan of said track by said dimensioned spot to develop, in a plane substantially parallel to said track, a time-varying beam diffraction pattern comprising at least one first order time-varying diffracted beam component that generates a pattern of displacements related to said second spatial pattern; and

light responsive means positioned to monitor only said pattern of time-varying first order beam component displacements for deriving an electrical signal corresponding to said information signal thereby effecting a direct detection of said information from said frequency modulated carrier.

3,919,466

MANUAL DIAGNOSIS EQUIPMENT FOR MOTOR VEHICLES

Franco Huwyler, and Horst Engele, both of Milan, Italy, assignors to Fabbrica Italiana Magneti Marelli, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 348,512, April 6, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,491

Claims priority, application Italy, Apr. 22, 1972, 23441/72

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **8 Claims**

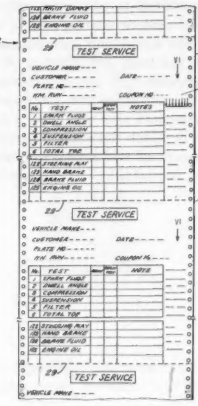
1. Apparatus for guiding the test of an automotive vehicle and for recording the results of tests comprising, in combination:

an elongated recording form having thereon, in serial row form, a plurality of named tests each associated with a given code indication and in column form, regions for recording test results corresponding to a given test, form moving means for longitudinally moving said form, a test result recording means operable to record a test result in

a test result column on said form corresponding to a particular test;

a test sequence presetting means for presetting a desired test sequence to be performed on a given vehicle;

sensor means disposed adjacent said form and reading said code indication on said form as said form moves past said sensor means;



automatically operable control means connected to said test sequence presetting means, said test result recording means, and to said form moving means for automatically moving said form to the next test position in a given sequence of tests in response to the operation of said test result recording means.

3,919,467

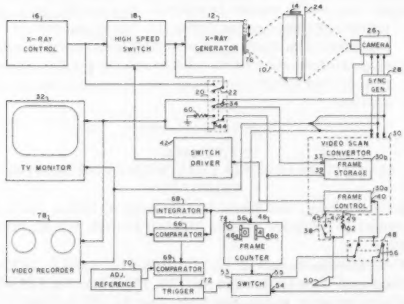
X-RAY BAGGAGE INSPECTION SYSTEM

Richard S. Peugeot, Atlanta, Ga., assignor to Ridge Instrument Company, Inc., Tucker, Ga.

Filed Aug. 27, 1973, Ser. No. 392,035

Int. Cl.² H04N 7/18

U.S. Cl. 178—6.8 **2 Claims**



1. An X-ray inspection system comprising:

X-ray generating means for generating and directing an X-ray beam over a predetermined path;

X-ray-to-visible light conversion means positioned to intercept said beam and to provide a visible light image corresponding to the details of an object positioned in said path in accordance with the degree of transparency to X-rays of portions of the object;

electronic imaging means for scanning said image and producing at a predetermined scanned rate periodic sets of image information, each set representing a complete replica, or frame, of said image, and each set occurring during a frame period;

image storage means responsive to an output from said imaging means and a control signal for storing as a single frame information and, providing as an output, an image from at least one said frame of said image from one or more successive scanned frames of said image;

synchronization means for generating at least one recurring signal at said predetermined scanned rate and interconnecting and synchronizing at said rate information scanned by said imaging means and stored by said storage means;

control means responsive to said recurring signal of said synchronization means and coupled to said storage means and said X-ray generating means for selectively providing said control signal and turning on said X-ray generating means during and for a selected number of image frame periods, whereby an image of a desired exposure is obtained in said storage means, said control means comprising signal means responsive to the output of said image storage means for providing a contrast signal and providing a said control signal to turn off said X-ray generating means when said contrast signal reaches a predetermined level; and

image display means coupled to the output of said storage means for selectively displaying a said stored image.

3,919,468

CHARGE TRANSFER CIRCUITS

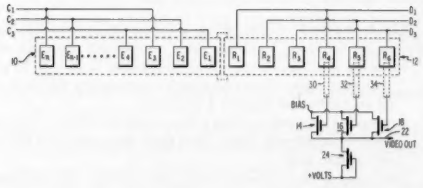
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 27, 1972, Ser. No. 309,755

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N 3/14

U.S. Cl. 178—7.1 **9 Claims**



1. A circuit for increasing the amplitude of signals produced in response to radiant energy excitation comprising, in combination;

a radiant energy sensing array including a plurality of locations, each defining one resolution element of the array, each location responsive to radiant energy excitation for producing a charge signal, and each location including means for storing its charge signal; and

means for combining the charge signal stored at groups of *n* adjacent locations, to provide a plurality of combined signals, fewer in number than the charge signals produced by the array, but each combined signal of greater amplitude than the individual ones of its constituent parts, where *n* is an integer greater than 1.

3,919,469
SENSOR PROVIDED WITH A PICK-UP PANEL

Wolfdietrich Georg Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

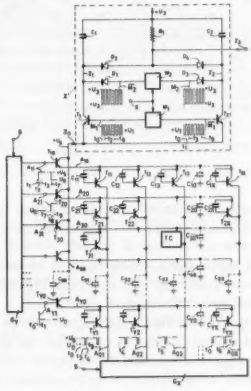
Filed Feb. 22, 1973, Ser. No. 334,868

Claims priority, application Netherlands, Mar. 4, 1972, 7202906

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N 3/16

U.S. Cl. 178—7.1 **9 Claims**



1. A sensor provided with a pick-up panel formed with a cross-bar system of row and column conductors and pick-up elements occurring between intersections, said conductors being connected to outputs of row and column scanning generators each applying successive pulses with a reference voltage to the outputs, said panel being connected to an output circuit for applying an output signal to an output of the sensor through a row and column selection, a plurality of row selection transistors having bases, collectors and emitters, the outputs of the row scanning generator being separately connected to the bases of said row selection transistors, the emitter of each row selection transistor being connected to a separate row conductor, each output of the row scanning generator thereby being connected to a correspnding row through the base and emitter of a corresponding row selection transistor, means for interconnecting the collectors of said row selection transistors and for connecting said interconnected collectors to the output circuit, said row scanning generator providing each row selection transistor base with a D.C. bias during the scanning of a corresponding row.

3,919,470
ASYMMETRIC APERTURE CORRECTOR FOR A TELEVISION IMAGE SIGNAL

Hendrik Blom, and Prudent Eduardus Jacobus Mollet, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,803

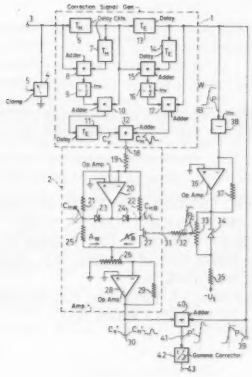
Claims priority, application Netherlands, June 10, 1972, 7207934

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N 5/14

U.S. Cl. 178—7.1 **8 Claims**

1. An aperture corrector for a television image signal, which corrector is provided with at least a delay circuit and a signal combination circuit for deriving from the image signal varying between a black level and a peak-white value an aperture correction signal having a negative and a positive going signal value relative to a reference value, characterized in that the corrector is provided with a signal amplifier having different amplification factors for the said positive and negative signal values in the aperture correction signal to be applied to an input, so that the corrector has an output for applying an asymmetric aperture correction signal built up of a relatively attenuated correction signal which is derived from the image signal value located nearer the black level and a relatively amplified correction signal which is derived from the image signal value located nearer the peak-white value.



8. A method for aperture correcting a television signal varying between black and white levels, said method comprising deriving from said signal a symmetric aperture correction signal having positive and negative going component signals, reducing black area extension by deriving from said symmetric aperture correction signal an asymmetric aperture correction signal having a large correction signal near said white level and a relatively small correction signal near said black level, and applying said asymmetric correction signal to said television signal.

3,919,471
TV SIGNAL CORRECTION CIRCUITRY

Andrew J. Spiessbach, Eugene, Oreg.; William F. Parrish, Baltimore, Md., and Paul G. Kennedy, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,232

Int. Cl.² H04N 5/14

U.S. Cl. 178—7.1 **12 Claims**

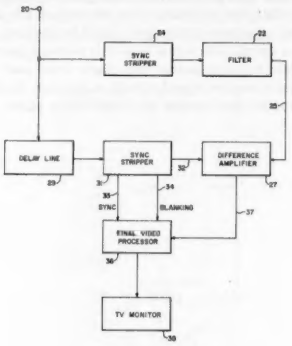
1. Waveform correction circuitry comprising

A. input means for receiving input video signals each subject to inclusion of an undesirable shading component;

B. first circuit means for extracting any low frequency components of said video signals for deriving corrective waveforms;

C. second circuit means for applying said corrective wave-

forms to said video signals for reducing said shading component; and

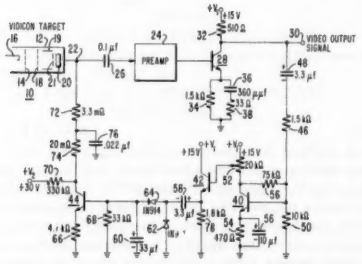


D. circuit means for removing the synchronizing and blanking pulses from said video signal prior to filtering.

3,919,472
AUTOMATIC TARGET CONTROL SYSTEM FOR A TELEVISION CAMERA TUBE

Denis Peter Dorsey, Levittown, Pa.; William E. Rodda, and Ralph Stuart Filson, both of Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,755
Int. Cl.² H04N *5/38*
U.S. Cl. 178—7.2 **5 Claims**



1. In an automatic control system for a television pickup tube of the type in which a characteristic of the output signal developed is sampled to provide a control voltage representative of unc.sired changes thereof for use in biasing a target electrode of said pickup tube in a direction to stabilize said characteristic, the combination therewith of:

a first amplifier having an outpu. terminal at which a relatively low impedance is presented;

detector means coupled to said output terminal providing a direct current output voltage proportional to the peak-to-peak amplitude of an applied input signal;

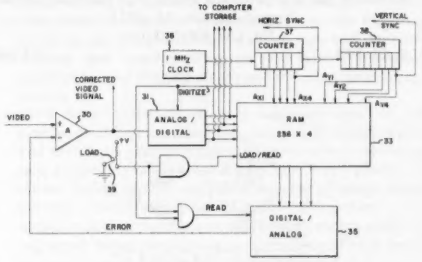
means coupling the output signal developed by said television pickup tube to an input terminal of said first amplifier; and

a second amplifier responsive to said direct current output voltage from said detector means for providing said control voltage to said target electrode in stabilizing the peak-to-peak amplitude of said pickup tube output signal at a predetermined level.

3,919,473
SIGNAL CORRECTION SYSTEM

Douglas A. Cotter, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,742
Int. Cl. H04n *5/14*
U.S. Cl. 178—7.2 **7 Claims**



1. A signal processing system wherein an input signal S(w) contains an error component $e(w)$ and a signal component s(w) comprising:

a summer, said input signal being applied to said summer;

a digital memory storing digital words representing the pattern of said error component $e(w)$;

a digital-to-analog converter, said digital words being applied to said digital-to-analog converter to produce an analog error signal $\bar{e}(w)$, said error signal being applied to said summer to produce an approximation $S'(w)$ of said signal component;

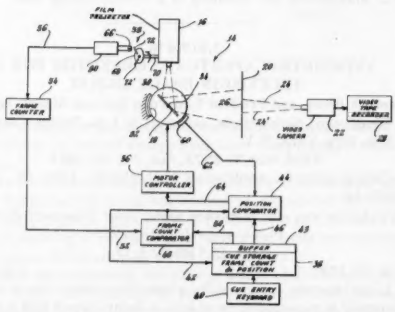
an analog-to-digital converter, the output of said summer being applied to said analog-to-digital converter; and

digital logic circuitry operable during intervals of time when said signal component is zero to load digital words from said analog-to-digital converter, said digital words representing the pattern of said error signal, said digital words being loaded into said digital memory to update the contents of said memory thereby providing a new error correction $\bar{e}(w)$.

3,919,474
SYSTEM FOR TRANSFERRING MOTION PICTURE FILMS TO VIDEO RECORDINGS, AND FOR CHANGING ASPECT RATIOS

Kenneth Blair Benson, South Norwalk, Conn., assignor to Goldmark Communications Corporation, Stamford, Conn.

Filed Jan. 18, 1974, Ser. No. 434,607
Int. Cl.² H04N *5/30*
U.S. Cl. 178—7.2 **15 Claims**



13. In a system for generating a video recording of a motion picture film projection being projected with a film projector

with an aspect ratio which is greater than the video recording aspect ratio, the film projection being blanked during a film frame pull-down cycle, with the video recording being made in accordance with the film editor produced cue information formed of cue position data and cue film length data, the improvement comprising

a video camera having an optical input;

a rotatable scanning element located to enable positioning of a motion picture film projection relative to the optical aperture of the video camera; said rotatable scanning element having a mass which is selected sufficiently low to enable repositioning thereof during a film frame pull-down cycle;

means producing a frame signal during the time of blanking of the film projection; and

means actuated by the frame signal for locating the rotatable scanning element during the film frame pull-down cycle in accordance with the cue position data at corresponding film lengths determined by the cue film length data.

3,919,475

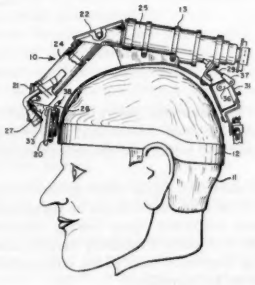
HEAD ATTACHED TELEVISION

Peter P. Dukich, Blaine; Robert L. Lechevalier, Minneapolis, and John A. Volk, West St. Paul, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1974, Ser. No. 513,432

Int. Cl.² H04N *7/18*

U.S. Cl. 178—7.91 **8 Claims**



1. A remotely controlled head-mounted visual apparatus for viewing manual operations carried on by the wearer, said apparatus comprising

camera means for generating signals representative of a visual image received,

aiming means for determining the field of view of said camera means,

focussing means for said camera means,

illumination means for illuminating the field of view of said camera means,

control means for controlling said focussing and aiming means for said camera means,

means for reconverting said signals to reproduce said visual image,

means for transmitting said signals from said camera means to said means for reconverting,

real-time viewing means for viewing said reconverted image, and

means for mounting said camera means, focussing means and illuminating means on the head of the wearer.

3,919,476

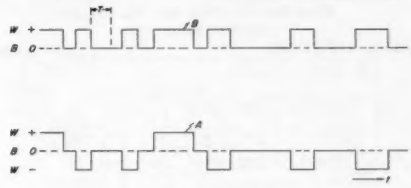
TIME DEPENDENT TWO-TO-THRFE LEVEL ALTERNATE ENCODING

John D. Torpie, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,752

Int. Cl.² H04N *7/00*

U.S. Cl. 178—68 **21 Claims**



1. An encoder for encoding a data signal of the type that makes successive excursions from a predetermined level, said encoder comprising the combination of

bipolar means selectively operable in inverting, non-inverting, and quiescent modes; and

control means coupled to said bipolar means for controlling the operating mode thereof in response to said data signal; said control means including

means for holding said bipolar means in said quiescent state whenever said data signal is at said predetermined level; and

timing means triggered when said data signal goes to said predetermined level for operating said bipolar means in different ones of said inverting and non-inverting modes during adjacent excursions of said data signal from said predetermined level only if the adjacent excursions occur within a predetermined period of time.

3,919,477

METHOD AND APPARATUS FOR THE PRODUCTION OF MULTICHANNEL SOUND SIGNALS

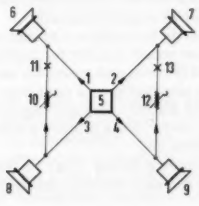
Peter Klaus Burkowitz, Isernhagen-NBS, Germany, assignor to Polygram GmbH, Hamburg, Germany

Filed June 4, 1973, Ser. No. 366,554

Claims priority, application Germany, June 7, 1972, 2227705

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **3 Claims**



1. A method of restoring two channel signals of a two-channel signal source by modifying the right front and left front signals of a four-channel source having individual channels for the left front signal, the right front signal, the left rear signal, and the right rear signal, such four signals having been derived from signals of said two-channel source, comprising the steps of: selecting a first portion of the left rear signal, inverting said first portion to produce a first inverted signal, and mixing only said first inverted signal with said left front signal for modifying said left front signal, selecting a second portion of the right rear signal, inverting said second portion to produce the second inverted signal, and mixing only said second inverted

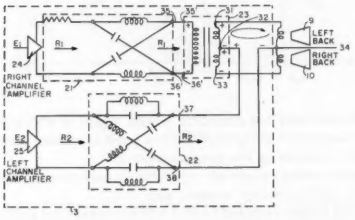
signal with said right front signal to produce a modified right front signal, whereby said modified left front and right front signals restore the signals of said two-channel source.

3,919,478

PASSIVE FOUR-CHANNEL DECODER

Wayne M. Schott, Mt. Prospect, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,454
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 GQ **3 Claims**



1. A sound system for utilizing a pair of quadrature-encoded composite stereo signals E_1 and E_2, with E_1 comprising an RF component plus both R_B and L_B components and E_2 comprising an LF component plus both R_B and L_B components, where L_F, R_F, L_B and R_B are discrete left front, right front, left back and right back quadraphonic audio signals, respectively, and where the resultant vector of the back signal components of E_1 is either in phase or 180° out of phase with the resultant vector of the back signal components of E_2, to provide a quadraphonic sound rendition from four sound speakers in a left front, right front, left back and right back room orientation, in which said left back speaker and said right back speaker each include a voice coil comprising a pair of input terminals with one terminal of each said pair connected to a common junction, comprising:

a pair of audio amplifiers individually translating an assigned one of said composite signals;

a passive 90° symmetrical phase-shifting lattice network coupled to one of said audio amplifiers for shifting the phase of a first of said composite signals and having a pair of output terminals;

a passive 180° symmetrical phase-shifting lattice network coupled to the other of said audio amplifiers for shifting the phase of a second of said composite signals and also having a pair of output terminals;

means for directly coupling one of said audio amplifiers to said left front sound speaker for applying said first composite signal thereto, and means for directly coupling the other audio amplifier to said right front sound speaker for applying said second composite signal thereto;

a transformer comprising a primary winding having a pair of input terminals and

a secondary winding having a pair of output terminals and a reference terminal intermediate said secondary output terminals;

means for coupling the output terminals of said 90° phase shifting network across the input terminals of said primary winding;

means for coupling the output terminals of said secondary winding across the free input terminals of said voice coils; and

means for coupling one output terminal of said 180° phase shifting network to said reference terminal of said secondary winding and for coupling the other output terminal of said 180° phase shifting network to said common junction of said voice coils,

whereby said coupling of said phase-shifting networks to said transformer additively and subtractively combine the phase-shifted composite signals to obtain a pair of resultant signals E_3 and E_4, E_3 comprising a L_F, R_F and R_B component but free of any L_B component and E_4 comprising a L_F, R_F and L_B component but free of any R_B component, and

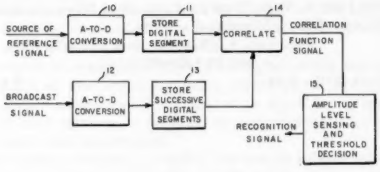
means for applying said resultant signal E_3 to the right back sound speaker and said resultant signal E_4 to the left back sound speaker.

3,919,479

BROADCAST SIGNAL IDENTIFICATION SYSTEM

Warren D. Moon, Walpole; Richard J. Weiner, Norwood; Robert A. Hansen, Burlington, and Robert N. Linde, Marion, all of Mass., assignors to The First National Bank of Boston, Boston, Mass.

Continuation of Ser. No. 290,835, Sept. 21, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,978
Int. Cl.² G10L 1/02
U.S. Cl. 179—1 SB **14 Claims**



1. A process for automatic electronic recognition and identification of programs and commercial advertisements broadcast on television and radio, said process comprising the steps of

processing a reference signal which constitutes the program or commercial advertisement to be identified to produce a processed reference signal having frequency components in the sub-audio frequency range corresponding to the syllabic frequency rates of the information content of said signal to be identified;

generating a digitally sampled reference signal segment having a selected sampling rate and time duration, said reference signal segment representing at least a part of said processed referenced signal;

processing a broadcast signal in the same manner as said reference signal so as to produce a processed broadcast signal having frequency components in the sub-audio frequency range corresponding to the syllabic frequency rates of the information content of said broadcast signal;

generating a plurality of successive digitally sampled broadcast signal segments, each said digitally sampled broadcast signal segment having the same sampling rate and time duration as the selected sampling rate and time duration of said reference signal segment;

correlating each successive broadcast signal segment with said reference signal segment to produce a correlation function signal which has a relatively small amplitude level when said correlated signal segments are different and a relatively large amplitude level when said correlated signal segments are the same; and

sensing the amplitude level of said correlation function signal to provide a recognition signal when the amplitude of said correlation function signal exceeds a selected threshold level to identify the presence of said program or commercial advertisement in said broadcast signal.

3,919,480
DECODING APPARATUS FOR REPRODUCING FOUR SEPARATE INFORMATION SIGNALS

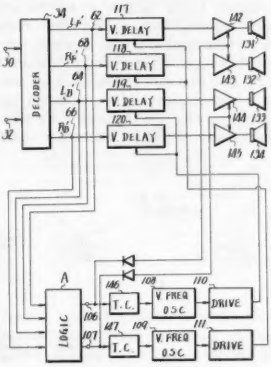
Takeshi Fukami, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1974, Ser. No. 526,333

Claims priority, application Japan, Nov. 29, 1973, 48-134198

Int. Cl.² H04N *5/00*

U.S. Cl. 179—1 GQ **4 Claims**



1. A decoding apparatus for reproducing four separate information signals comprising:

A. a decoder for receiving first and second composite signals each of which includes at least three of the four information signals in preselected amplitude and phase relationships and for producing first, second, third and fourth output signals, respectively, containing a different one of said information signals as a predominant signal and a different pair of said audio information signals as subdominant signals;

B. first, second, third, and fourth transmitting channels for transmitting said first, second, third and fourth output signals, respectively;

C. a control signal producing circuit for producing at least one control signal by comparing the magntidues of said predominant signals in at least two of said transmitting channels; and

D. variable delay circuits connected to said transmitting channels, respectively, to transmit respective ones of the output signals and connected to said control signal producing circuit to be controlled by the signal therefrom to delay said output signals selectively.

3,919,481
PHONETIC SOUND RECOGNIZER

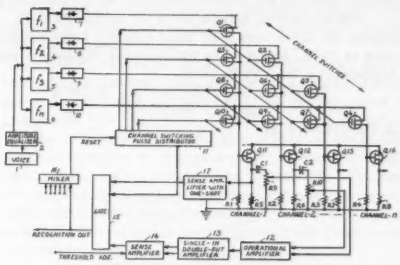
Meguer V. Kalfaian, 962 Hyperion Ave., Los Angeles, Calif. 90029

Filed Jan. 3, 1975, Ser. No. 538,346

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SA **4 Claims**

1. A signal matching system for deriving an information-representing signal from the signal-amplitude-ratio between first and second signals when said ratio matches with an arrangement of prefixed signal-amplitude-ratio adjustments in first and second channels during a predetermined time period in which a control signal is produced, said system comprising means for producing said control signal; first and second channels; coupling means from said first and second signals to said first and second channels, said channels having prefixed signal-amplitude-gain adjustments, so that the signal-amplitudes of said first and second signals are equalized at the outputs of said first and second channels in the form of a null signal only when the signal-amplitude-ratio between said first and second signals matches with said prefixed adjustments; a signal sensing means for deriving a sensing signal from said



first and second signals; and means for deriving a discrete signal representing said information from the combination of said null-signal, said control-signal, and said sensing-signal, last said signal making sure that said null-signal is derived only from the presence of said first and second signals, and not from their absence in said channels.

3,919,482
FM RECEIVER NOISE SUPPRESSION CIRCUIT

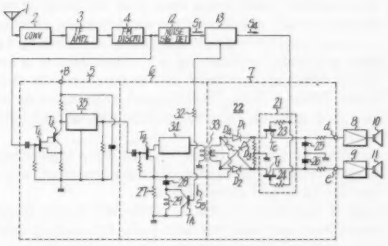
Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1971, Ser. No. 205,072

Claims priority, application Japan, Dec. 11, 1970, 45-110881

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **14 Claims**



1. In an FM receiver which includes an FM discriminator connected to an intermediate-frequency amplifier having a limiter, and a stereo demodulator circuit connected to said discriminator for reproducing stereophonic audio signals, the combination comprising a gate circuit connected to an output stage of said stereo demodulator circuit, a noise signal detector circuit connected to said discriminator for detecting a noise signal of a frequency higher than that of a composite stereo signal, means for producing a control signal by said noise signal derived from said noise signal detector circuit to control said gate circuit to cut it off with said control signal when said noise signal is detected, a switching signal producing means for producing the switching signal to be supplied to said demodulator circuit, the switching signal producing means including a resonance circuit resonant with a pilot signal, the resonance of the resonance circuit being changed with said control signal, said control signal producing means comprising a monostable multivibrator operable with said noise signal and a waveform shaping circuit causing the output

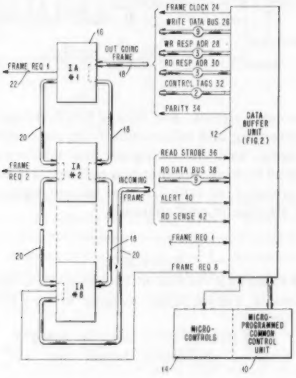
of the multivibrator to form a rectangular wave of a width corresponding to the duration of the noise signal.

3,919,483

PARALLEL MULTIPLEXED LOOP INTERFACE FOR DATA TRANSFER AND CONTROL BETWEEN DATA PROCESSING SYSTEMS AND SUBSYSTEMS

Abraham M. Gindi, San Jose, and Donald J. Lang, Cupertino, both of Calif., assignors to International Business Machines Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,970
Int. Cl.² H04J 3/08
U.S. Cl. 179—15 AL **11 Claims**



1. A communication mechanism for use between computer subsystems and a data processor comprising:

a first parallel multiplexed data path outgoing from said data processor, connecting the subsystems in a first chain; a second parallel multiplexed data path incoming to said data processor, connecting the subsystems in a second chain, which second chain, in combination with said first chain, forms a closed multiplexed loop including within said loop said computer subsystems and said data processor;

a plurality of simplex frame request lines connected between said subsystems and said data processor, one such line for each said subsystem; and

means in said data processor, connected to said frame request lines and said first data path, for sending information over said first data path in response to a request signal received on one of said request lines, said information including an address identifying the subsystem corresponding to said one of said request lines.

3,919,484

LOOP CONTROLLER FOR A LOOP DATA COMMUNICATIONS SYSTEM

Nicholas Frank Maxemchuk, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,266
Int. Cl.² H04J 3/08
U.S. Cl. 179—15 AL **5 Claims**

1. In a time division multiplexed loop communications system having a plurality of data processors connected in series relation forming a loop, a loop controller connected in said loop and in series with said data processors, said loop controller comprising:

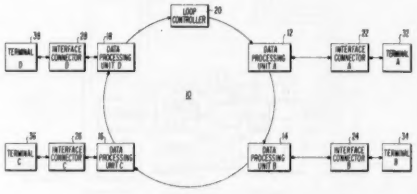
means adapted for receiving and demodulating signals received from said loop;

means couples to said receiving and demodulating means for extracting timing information signals from said signals received from said loop;

timing means for providing transmit timing signals, synchronization signals and framing information signals;

means responsive to said extracted timing information signals and to said transmit timing signals for retiming said demodulating signals with transmit signal timing information;

a signal delay means for imparting an adjustable delay time to said retimed demodulating signals, said signal delay means comprising first and second shift registers, said first shift register being adapted to receive said retimed demodulated signals, said second shift register being adapted to receive marker signals at times corresponding to said first shift register receiving said retimed demodulating signals, said first shift register further being adapted to receive a spacer signal after receiving said retimed demodulated signals, said second shift register being adapted to receive a spacer indication signal at times



corresponding to the receiving of a spacer signal by said first shift register, the delay provided by said signal delay means being related to the total number of spacer indication signals stored in said second shift register;

a frame comparison means for comparing framing information from the signals provided by said delay means with the framing information signals from said timing means and for providing a search signal to said delay means based on the results of said comprison;

means for coupling said search signal to said signal delay means;

means for altering the total number of said spacer indication signals in said second shift register in response to said search signal for adjusting the delay time provided by said signal delay means;

means for multiplexing the delayed signals from said delay means with said framing and synchronization signals from said timing means; and

means for modulating said multiplexed signals in accordance with a particular modulation rule and for transmitting said modulated signals on said loop.

3,919,485

CIRCUIT ARRANGEMENT FOR CENTRALLY CONTROLLED TELEPHONE EXCHANGE INSTALLATIONS HAVING CARRIER FREQUENCY DEVICES

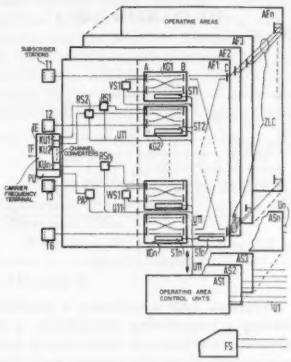
Gunther Lohr; Franz Loffler, and Alfred Schaller, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 208,112, Dec. 15, 1971. This application July 8, 1974, Ser. No. 486,500
Int. Cl.² H04J 1/16
U.S. Cl. 179—15 BF **6 Claims**

1. In a telephone exchange installation operated by a central control unit using electronic data processing techniques having multiple state switching matrices over which connections are completed utilizing line finding devices and having carrier frequency channels connected to the terminals of said switching matrices, said carrier frequency channels being formed

into groups, which groups are each under functional control of a pilot supervision device, the improvement comprising:

memory means for storing the idle/busy conditions of all portions of said switching matrices for use in line finding, logical circuit means functioning with said memory means to form a line finding device,

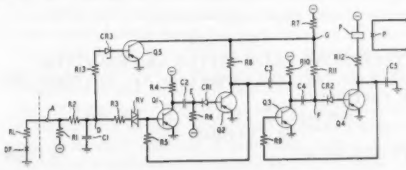


means in each said pilot supervision device for generating and transmitting a blocking signal responsive to a busy condition in at least one of the carrier frequency channels with which that pilot supervision device is associated and means for receiving said blocking signal and causing information to be stored in said memory indicating the switching matrix terminals to which the group of carrier frequency channels including said busy carrier frequency channel are connected to be busy.

3,919,486
PULSE CORRECTOR

Drahomir F. Havranek, Downers Grove, Ill., assignor to Western Electric Company, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,476
Int. Cl.² H04Q 1/36
U.S. Cl. 179—16 EA **12 Claims**



1. A pulse corrector responsive to a series of input pulses within a range of input pulsing speeds to produce a corresponding series of output pulses having the same pulsing speeds as the corresponding input pulses and having a substantially constant output duty cycle, wherein the output duty cycle is determined jointly by a fixed interval timer and a variable interval timer, wherein output means is controlled according to the output duty cycle to produce output pulses, wherein the variable timer comprises a resistance-capacitance time constant network, and wherein an asymptote voltage is provided for the network so that during the variable interval the capacitance derives a changing voltage at a rate determined jointly by the time constant and the asymptote voltage, wherein the improvement comprises

A. means controlled by each input pulse to cause the fixed timer to determine a fixed time interval of a duration corresponding to a particular pulsing speed not faster than the slowest pulsing speed;

B. means controlled by the fixed timer at the end of each fixed interval to establish for the network a low asymptote voltage so that the voltage of the capacitance starts to change toward a prescribed voltage at a slow rate corresponding to the low asymptote voltage and so that the changing voltage of the capacitance reaches the prescribed voltage at the end of a maximum variable time interval of a maximum duration corresponding to the said particular pulsing speed;

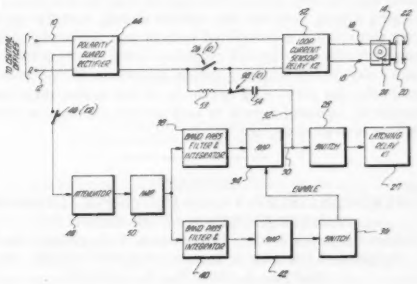
C. and, means controlled by the fixed timer at the start of the next succeeding fixed interval, if the input pulsing speed is faster than the said particular pulsing speed, to change the low asymptote voltage to a high asymptote voltage so as to allow the changing voltage of the capacitance to continue to change toward the prescribed voltage at a fast rate corresponding to the high asymptote voltage and so that the changing voltage of the capacitance reaches the prescribed voltage at the end of a variable time interval shorter than the maximum duration and corresponding to the faster input pulsing speed;

D. the output cycle being defined as the ratio between the total variable time interval and that portion of the fixed time interval which exceeds that portion of the variable time interval during which the voltage of the capacitance changes at the fast rate.

3,919,487
TELEPHONE INSTRUMENT DISCONNECT CIRCUIT

Bruce C. Gabrielson, Huntington Beach, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed June 14, 1974, Ser. No. 479,535
Int. Cl.² H04B 3/46; H04M 1/00
U.S. Cl. 179—17 R **14 Claims**



1. In a remote disconnect circuit for enabling the disconnection of subscriber's telephone instrument from a pair of line conductors by which telephone service is normally extended from a Central Office, the telephone instrument including a receiver, a pair of line terminals for connection to the pair of line conductors and means for selectively coupling the receiver to the pair of line terminals to provide a closed d.c. circuit across the line terminals, the disconnect circuit comprising:

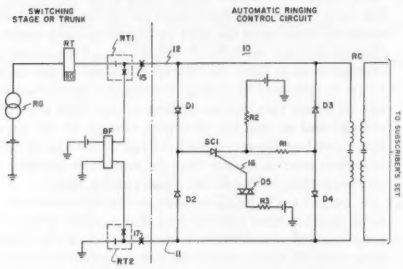
switch means connected in at least one of said pair of line conductors between the Central Office and the telephone instrument line terminals for selectively disconnecting or connecting at least one of the line terminals from the respective line conductor; and

first control means connected to the line conductors and responsive to a closed d.c. circuit across the line terminals and to the application of a control signal on the line conductors for operating said switch means to disconnect the telephone instrument line terminals from the line conductors only when the telephone instrument's receiver is connected across the line terminals.

3,919,488
RING CONTROL CIRCUIT

Generoso Acevedo, and Ashok Chadrakant Jhatakia, both of Milan, Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,507
Int. Cl.² H04M *3/02*
U.S. Cl. 179—18 HB 4 Claims

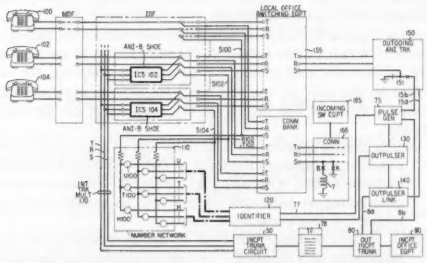


1. A ring trip control circuit for a telephone system in which the system has a source for transmitting AC ringing signals to a called line, a ring trip relay for disconnecting the ringing signals from the called line responsive to the called line going off-hook and answer supervision means responsive to the called line going off-hook, the ring trip control circuit comprising means for sensing ringing current applied to a predetermined called line, means responsive to sensed ringing current to said last-mentioned line for simulating an off-hook condition for completing a direct current path to the ring trip relay and thereby operate the ring trip relay to disconnect the ringing source from the ring control circuit, contacts on said ring trip relay in a completed path to said simulating means, said contacts opening said completed path on energization of said relay, said simulating means responsive to operation of said relay for preventing operation of the answer supervision means by opening a path to said answer supervision means before operation thereof.

3,919,489
THYRISTOR CIRCUITRY FOR PROVIDING AUTOMATIC NUMBER IDENTIFICATION SERVICES

Robert Frederick Schillo, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 4, 1974, Ser. No. 430,926
Int. Cl.² H04M *3/52*
U.S. Cl. 179—27 G 30 Claims

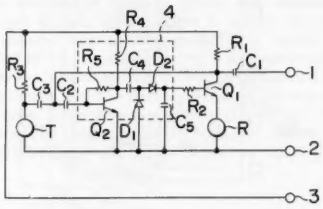


19. The intercept facilities of claim 17 in which said second means in said called shoe for extending said identification signal comprises a semiconductor switch circuit connected between said determining means and said outgoing trunk equipment.

3,919,490
CROSSTALK PREVENTION IN INTERPHONE SYSTEMS AND THE LIKE

Shigemasa Ichikawa, Nagoya, Japan, assignor to Aiphone Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 23, 1973, Ser. No. 408,589
Claims priority, application Japan, Mar. 30, 1973, 48-37315
Int. Cl.² H04M *1/19*
U.S. Cl. 179—37 2 Claims

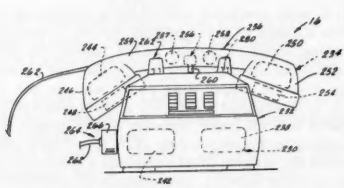


1. In an interphone system including a plurality of units, each unit having a transmitting microphone, a receiver, a common terminal and at least one power source terminal, said transmitting microphone and said receiver both being coupled to said common terminal and to one power source terminal, the improvement which comprises a circuit for preventing crosstalk comprised of a combination amplifier-rectifier means having input and output sides, the input side thereof being coupled to said common terminal, said combination means rectifying one part of an input signal received by said unit at said common terminal into a d.c. signal, and switching means connected in series with said receiver and coupled to the output side of said combination means and controlled thereby, said switching means being normally open, thereby maintaining said receiver in an inoperative state, and being switched to a closed state by a d.c. signal from said combination means of above a predetermined level, said predetermined level being set so that only communication signals, rather than crosstalk from other units, switch said switching means to the closed state, said receiver being activated when said switching means is closed, whereby weak crosstalk signals are prevented from passing through the receiver and only communication signals are passed therethrough.

3,919,491
TELEPHONE TRANSMITTER AND RECEIVER

Curtis L. Luce, 14013 Old Harbor Lane, Apt. 208, Marina Del Ray, Calif. 90291

Filed Sept. 12, 1973, Ser. No. 396,388
Int. Cl.² H04M *1/02*
U.S. Cl. 179—41 A 1 Claim



1. In a telephone having a base with a cradle and a handset removably mountable on the cradle thereof, a telephone extension comprising:

a. a base station in the telephone base, said base station coupled to the telephone line and having a receiver to receive sound communication from the telephone handset and send it as outgoing speech signals on the line, and

a transmitter to transmit incoming speech signals from the line to the telephone handset,

b. a portable station in the handset having a transmitter to transmit sound communication from the handset microphone to said base station receiver, and having a receiver to receive said incoming speech signals from said base station transmitter and relay them to the handset speaker,

c. said handset being physically connectable with the telephone base by a removable plug, said handset to be normally used as a usual telephone handset when said plug is connected to said telephone base, said plug, upon removal from said base, activating said base station and portable station transmitters and receivers to allow remote communication between handset and base.

3,919,492

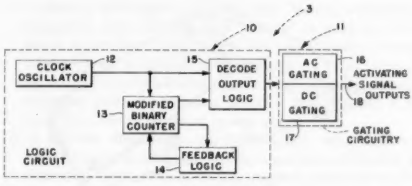
SOLID STATE INTERRUPTER

Walter G. Borland, Waterford, Pa., assignor to Basic Incorporated, Cleveland, Ohio

Filed Aug. 29, 1973, Ser. No. 392,431

Int. Cl.[2] H04M *1/26*

U.S. Cl. 179—84 R **18 Claims**



1. A solid state circuit for cyclically interrupting a plurality of input signals and providing the same as a plurality of interrupted activating output signals, the latter signals being provided at respective output channels, comprising means for receiving such plurality of input signals; a plurality of output channels on which such plurality of interrupted activating output signals are provided; clock means for providing a cyclical clock signal; counting means coupled to said clock means for cyclically counting sequentially to a plurality of discrete counting levels, said counting means generating counting signals indictive of the discrete counting levels; generating means for generating a plurality of logic signals in response to such cyclical clock signal and such counting signals; and gating means coupled to said generating means for selectively gating such plurality of input signals to pass the same to such respective output channels in response to receipt of respective logic signals, said gating means passing to respective output channels each of such interrupted activating output signals and each such interrupted activating output signal being passed at a respective frequency and for a respective duty cycle.

3,919,493

TELEPHONE RINGING CIRCUIT

Jean-Michel Person, Rue du Parc St. Jacques; Gerard J. P. Pays, Rue de Lanneg Braz, and Jean-Michel A. Garnier, Rue Jean Moulin, all of Perros-Guirec, France

Filed June 3, 1974, Ser. No. 476,064

Claims priority, application France, June 28, 1973, 73.23710

Int. Cl.[2] H04M *1/26*

U.S. Cl. 179—84 R **4 Claims**

1. A ringing device in a telephone subset comprising:

an A.C. ringing source;

a rectifier having positive and negative output terminals for rectifying the current of said source;

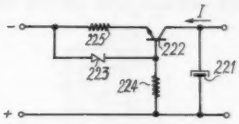
an energy storing capacitor;

a low frequency oscillator having a characteristic period;

an electronic switch controlled by said oscillator having a closed and an open state;

an electro-acoustic transducer;

a charging circuit connected to said rectifier output terminals for charging said energy storing capacitor; and,



said switch, capacitor, and transducer constituting a circuit for discharging said capacitor through said electronic switch when in its closed state whereby the energy of said capacitor is transferred to said transducer.

3,919,494

PULSE CONTACT DELAYING MECHANISM FOR TELEPHONE DIALS

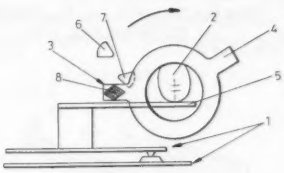
Angelo Manzoni, Milan, Italy, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 429,009

Claims priority, application Italy, Jan. 1, 1973, 19141/73; Feb. 15, 1973, 20419/73; Mar. 23, 1973, 22026/73

Int. Cl.[2] H04M *1/34*

U.S. Cl. 179—90 R **8 Claims**



3. A telephone dial pulsing mechanism of the type having a rotatable finger wheel and spring, a gear train assembly, a pair of flexible contact springs for producing impulses during rotation of said gear assembly, cam and yoke means rotated by said assembly for producing a time delay between the start of gear assembly rotation and the initiation of impulses produced by said contact springs wherein the improvement comprises fixed stop means positioned to cooperate with said cam and yoke means for providing lost motion time, and a fixed backstop member abutting one leg of said contact springs thereby holding said contact spring under tension so that the contacts remain in a normally closed position.

3,919,495

FEEDER DISTRIBUTION INTERFACE FOR RURAL AREAS

Richard Newman Berglund, Somerville; Ved Prakash Chaudhary, Ironia, and Richard Edward Kummer, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1974, Ser. No. 514,379

Int. Cl.[2] H04Q *1/14*

U.S. Cl. 179—98 **9 Claims**

9. A distribution interface for telephone cables comprising:

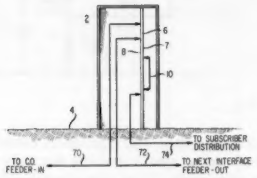
a field of input feeder connectors for terminating the conductors of an input feeder cable;

a field of output feeder connectors for terminating the conductors of an output feeder cable;

the connectors of said output feeder connector field corresponding on a one-for-one basis with the connectors of said input feeder connector field;

a field of distribution connectors for terminating distribution conductors;

first connection means for connecting any connector of said input feeder connector field to any connector of said distribution connector field, said first connection means



being incapable of connection to any connector of said output feeder connector field; and

second connection means for connecting any connector of said input feeder connector field only to the corresponding connector of said output feeder connector field;

said first and second connection means having structurally interfering elements preventing their simultaneous connection to the same connector of said input feeder connection field.

3,919,496

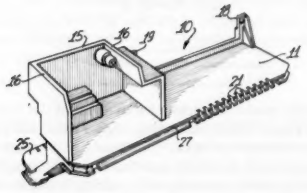
DIE CAST FRAME

Gerd Kuhfus, London, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Oct. 25, 1974, Ser. No. 518,055

Int. Cl.² H04M *1/02*, *1/20*

U.S. Cl. 179—100 R **2 Claims**



1. A die cast support frame for a telephone set comprising a laterally extending web;

a rearward top flange extending rearwardly for at least a major part of the length of the top edge of said web in a direction rearward to the plane of said web;

a forward top flange extending forwardly of said web at the top edge thereof for a portion of the length of said web; two side flanges extending downwardly from said forward top flange at each end thereof and also forwardly from a front surface of said web, said forward top flange, said side flanges forming with said web an enclosure for a microphone;

a bracket extending forwardly from the top edge of said web adjacent the end thereof remote from said forward top flange;

a projection on an end of said forward top flange nearer to said bracket, said bracket and said projection forming mounting positions for a pushbutton assembly, an upwardly extending rim along the rear edge of said rearward top flange, a rim extending along the bottom edge of said web, and connecting rims extending across each end of said frame connecting the ends of said rims on said rear edge of said rearward top flange and on said bottom edge of said web to form a substantially continuous rim around said frame, said rim having a concave cross-section to form a seating, and a resilient seal member positioned in said seating said seal member adapted to seat against an inner surface of a telephone housing when said support frame is positioned in said housing.

3,919,497

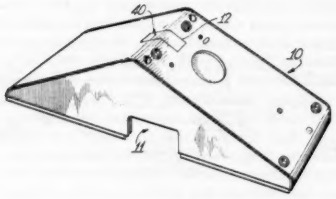
TELEPHONE HOUSING WITH CORD GROMMET AND SEAL

Gerd Kuhfus, London, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Oct. 31, 1974, Ser. No. 519,546

Int. Cl.² H04M *1/02*

U.S. Cl. 179—100 C **1 Claim**



1. A telephone housing comprising:

a base surface comprising two portions, a front portion and a rear portion, the portions extending at an obtuse angle to each other;

an elongated aperture in said base surface, said aperture formed at the junction of said portions and including a bottom portion extending into said forward portion of said base surface and a top portion extending into said rearward portion of said base surface;

a cord grommet for positioning in said aperture, said grommet including inner and outer portions and a main body portion enclosing a telephone cord, a transverse channel formation extending for at least the major part of the periphery of the grommet, said channel formation including an inner flange of relatively stiff formation and an outer flange of very flexible formation, the channel formation extending at an angle across each side of said grommet at the junction of said inner and outer portions when viewed from a sideways direction, said angle relative to the longitudinal axis of the grommet and equal to the angle extended between said portions of said base surface, the channel formation also extending along each side of said inner portion of said grommet, said channel formation adapted to engage the periphery of the aperture in said base surface, said inner flange in contact with the inner side of the housing base surface and the outer flange in contact with the outer side of the housing base surface, the arrangement such that the channel formation extending at an angle across each side of the grommet is engaged with said bottom portion of said aperture in one direction of insertion of said grommet and in engagement with said top portion of said aperture in an alternate direction of insertion.

3,919,498
ELECTROACOUSTIC TRANSDUCER

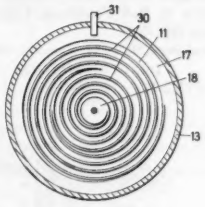
Palle-Finn Beer, Idunavagen 7, 181 61 Lindingo, Sweden

Filed June 14, 1973, Ser. No. 369,825

Claims priority, application Sweden, June 20, 1972, 8109/72

Int. Cl.² H04R 9/02

U.S. Cl. 179—115.5 PV **12 Claims**



1. An electrodynamic electroacoustic transducer comprising:

a. a unitary permanent magnet plate having a plurality of magnetic poles on one face thereof at least two of the poles extending along respective closed loops around a central pole, with said poles alternating in polarity, and forming respective transitional surface regions separating adjacent poles of opposite polarity, the opposite face of said plate being directed to the atmosphere;

b. a flexible diaphragm, of nonmagnetic and electrically nonconducting material, having a peripheral portion held stationary with respect to the magnet plate and a vibratable portion, disposed in the magnetic fields defined by said poles, bridging the transitional surface regions between adjacent poles, and in spaced confronting relation with said one face of the magnet plate; and

c. a continuous flexible conductor for carrying electrical current, said conductor being affixed to the vibratable diaphragm portion confronting the transitional surface regions between said pairs of adjacent poles, said conductor comprising a plurality of concentric sections, each section having a plurality of mutually adjacent unidirectional spiral convolutions, with the convolutions of each section confronting a respective transitional surface region and reversed in direction with respect to the convolutions of any section adjacent thereto.

3,919,499
PLANAR SPEAKER

James M. Winey, White Bear Lake, Minn., assignor to Magnepan, Incorporated, White Bear Lake, Minn.

Filed Jan. 11, 1974, Ser. No. 434,214

Int. Cl.² H04R 9/06

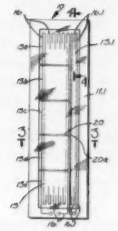
U.S. Cl. 179—115.5 PV **19 Claims**

1. A sound generating transducer comprising:

a stiff and acoustically transparent backing having a broad and substantially flat shape,

an audio sound-producing flexible diaphragm secured to the backing in confronting relation therewith and defining a vibratable area, the edges of the vibratable area being stationary against vibration with respect to the backing, the vibratable area of the diaphragm having a central portion with low frequency signal carrying conductive means thereon for vibrating the entire vibratable area generating low frequency sounds,

said vibratable area also having an elongate and narrow strip portion with high frequency signal carrying conductive means affixed thereon and substantially throughout said strip portion for vibrating the narrow strip portion of the diaphragm and generating high frequency sounds, and the mass of the high frequency signal carrying conductor means per square inch of diaphragm area on said strip portion being substantially less than the mass of the low frequency signal carrying conductive means per sqare inch of area of the diaphragm, and



said backing having means defining polarity characteristics to alternately attract and repel the diaphragm and cause diaphragm vibrations for sound production upon application of audio frequency electric signals to the conductive means.

3,919,500
ELECTRO-ACOUSTIC TRANSDUCERS

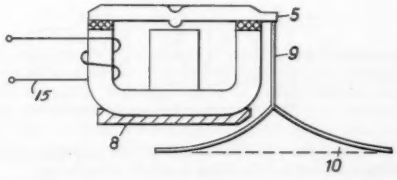
Leslie E. B. Dymoke-Bradshaw, Edgware, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,708

Claims priority, application United Kingdom, Mar. 27, 1973, 14545/73

Int. Cl.² H04R 11/00

U.S. Cl. 179—115 A **5 Claims**



1. An improved rocking armature transducer of the type having a U-shaped magnetic conducting yoke, a permanent magnet, an armature, an electromagnetic coil, and a diaphragm wherein the improvement comprises:

a magnet located intermediate said U-shaped magnetic conducting yoke;

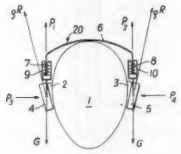
an armature pivotably located upon said magnet by means of at least one protrusion on said armature and having each end of said armature opposite each end of said yoke; an electromagnetic coil located on one leg of said yoke; a diaphragm connected to an extension on said armature by means of a drive rod for communicating vibrations from said armature to said diaphragm; and

at least one strip of compliant non-magnetic material interposed between the legs of said yoke and the ends of said armature for preventing said armature from contacting said yoke.

3,919,501
HEADPHONE CONSTRUCTION

Karl Cech, Modling, and Karl Reinthaler, Vienna, both of Austria, assignors to AKG Akustische u. Kino Gerate G.m.b.H., Vienna, Austria

Filed May 21, 1974, Ser. No. 471,896
Claims priority, application Austria, June 1, 1973, 4805/73
Int. Cl.² H04M *1/05*
U.S. Cl. 179—156 R **10 Claims**

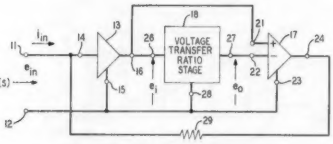


1. A headphone construction comprising two earpieces, at least one head band interconnecting said two earpieces and adapted to rest during use by its middle portion against the top of the user's head, the connection of said two earpieces to said headband including a resilient suspension holding the earpieces adjacent the ends of said band, said resilient suspension comprising a resilient member having a spring force slightly stronger than the effective gravitational force on said earpieces.

3,919,502
BALANCING NETWORK FOR VOICE FREQUENCY TELEPHONE REPEATERS

Gobind Tahilram Daryanani, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 19, 1974, Ser. No. 498,407
Int. Cl.² H04B *1/52*
U.S. Cl. 179—170 D **24 Claims**



7. A telephone system hybrid circuit balancing network having first and second input terminals comprising:

a first operational amplifier having first and second input terminals and an output terminal;

a second operational amplifier having an input terminal and an output terminal, said input terminal of said second operational amplifier connected to said first input terminal of said balancing network and said output terminal of said second operational amplifier connected to said first input terminal of said first operational amplifier;

voltage transfer ratio means connected between said output terminal of said second operational amplifier and said second input terminal of said first operational amplifier, said voltage transfer ratio means having a transfer function substantially identical to a scalar multiplier times the inverse of the impedance function of the telephone cable connected to said hybrid circuit;

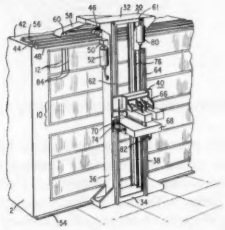
feedback resistance means connected between said output terminal of said first operational amplifier and said input terminal of said second operational amplifier; and

means for connecting said second input terminal of said balancing network to the common terminals of said voltage transfer ratio means, and said first and second operational amplifiers.

3,919,503
APPARATUS FOR ESTABLISHING CROSS CONNECTIONS IN AN AUTOMATED MAIN DISTRIBUTING FRAME

Hans Jack Friedrichsen, Bernardsville; Peter Frank Mahr, Morris Plains, and Alfred Otto Schwarz, Parsippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 9, 1974, Ser. No. 504,299
Int. Cl.² H04M *3/22*
U.S. Cl. 179—175.2 R **24 Claims**



1. Automated apparatus responsive to control signals for establishing and terminating cross-connections and providing test access to switches in an automated main distributing frame having a plurality of said switches in a lineup comprising rows and columns of said switches served by said apparatus, each of said switches including terminals thereon adapted to receive connectors therebetween for establishing said cross-connections and test lands along an edge thereof, comprising, in combination:

a switch engagement means for removing and replacing a respective one of said switches in said lineup;

connector plac ment means for installing and removing said connectors between said terminals when said respective switch is removed from said lineup;

positioning means for positioning said engagement means and said connector placement means adjacent said respective switch in said lineup; and

a test connector for contacting said test lands for providing said test access when said switch engagement means engages said switch.

3,919,504
METHOD AND APPARATUS ON IN-CIRCUIT TESTING OF A GROUP OF SEQUENTIALLY-OPERATED SYSTEM OUTPUT BISTABLE DEVICES

Thomas W. Crosley, Northlake, Ill., and Howard R. Miller, College Station, Tex., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 27, 1974, Ser. No. 446,575
Int. Cl.² H04M *3/26*
U.S. Cl. 179—175.2 R **2 Claims**

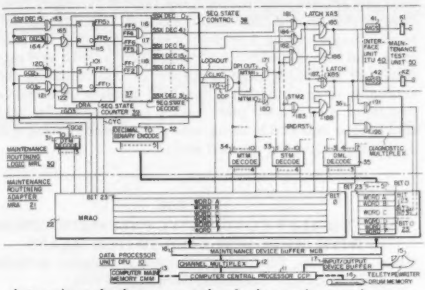
1. In a system having a sequentially-operated control unit including a group of bi-stable output devices responsive to the outputs of a sequence state counter, a method of in-circuit testing a selected one of the bi-stable devices, comprising:

advancing the sequence state counter to a sequence state associated with the selected device under test;

enabling subsequently the selected device under test to be controlled by the output of the counter;

providing processing means for determining the proper output condition for the selected device under test; and

selectively gating subsequently the output of the selected bi-stable device under test to said processing means to

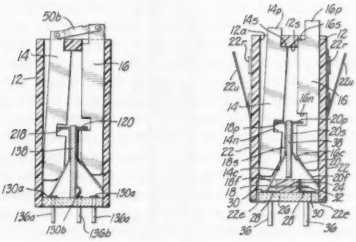


determine whether or not the device under test is operative.

3,919,505
MULTIPLE PUSH-BUTTON SWITCHING ASSEMBLY WITH ACTUATOR LATCH AND INTERLOCKING STRUCTURE

William Gene Becker, Riverside; Frank Joseph Bruder, Newport Beach, and Michael John Howett, Redlands, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed June 11, 1974, Ser. No. 478,412
Int. Cl.² H01H *9/20;* **H01C** *10/00*
U.S. Cl. 200—5 R **21 Claims**



1. A device for switching among a fixed array of electrical contacts, said device comprised of:

a cover member including at least one cover face portion having at least two apertures therethrough,

at least two movable contacts each including a cantilevered finger portion and electrically conductive means at least partially located on each finger portion, said finger portions being formed of a spring material;

means for engaging said fixed array of electrical contacts with each of said movable contacts disposed adjacent to a corresponding contact of said array,

at least two elongated actuating means captured in said cover member and adapted for moving against and deflecting respective finger portions of said movable contacts to provide physical contact and electrical connection between said electrically conductive portion of said movable contacts and corresponding contacts of said fixed array, each of said actuating means having at one end a protruding portion adapted for engagement by a user, a step portion near said one end and a cam surface at the other end for engaging a respective one of said finger portions, the finger portions of said movable contacts when deflected urging the return of said actuating means to a non-actuating position, whereby a momentary connection between said electrically conductive contact portion and a corresponding contact of said fixed array may be established by depressing said actuating means to deflect said finger portion, said connection being broken when said actuating means is released,

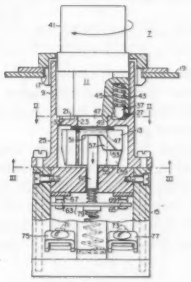
each of said protruding portions of said actuating means extending through a respective one of said apertures, each of said apertures being of a size and shape sufficient to allow said protruding portion to be laterally translated a small distance, said cover member further including a stationary step-like surface engaged by said step portion of each of said actuating means when said actuating means is depressed to deflect said finger portion and simultaneously laterally translated a small distance to enable said actuating means to be latched in a depressed position with the step portion of said actuating means pressed against the step-like surface of said cover member by the spring force of said finger portion; and

means for supporting said movable contacts.

3,919,506
DETACHABLY MOUNTED CAM OPERATOR FOR MULTIPLE RECIPROCATING CONTACT SWITCH ASSEMBLY

Walter J. Kellogg, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 3, 1974, Ser. No. 466,758
Int. Cl.² H01H *13/66, 21/80*
U.S. Cl. 200—16 A **7 Claims**



1. A switch comprising at least one set of upper stationary contacts, at least one set of lower stationary contacts, movable contact operating means including a guided reciprocable plunger and a bridging contact carrier with each set of stationary contacts, a cylindrical housing, a switch handle within one end of the housing and rotatable therein through one limited sector thereof, the handle being detachable from the housing for replacement in another limited sector of rotation, stop means within the housing for limiting rotation of the switch within a preselected sector, the switch handle being rotatable to a different number of switch positions in each sector, a cam detachably mounted on the handle and having a number of cam surfaces corresponding to the number of switch positions of the preselected sector, and the cam surfaces engaging a corresponding reciprocable plunger.

3,919,507
SAFETY INTERLOCK FOR POWER SWITCH OF INTERCONNECTED UNITS

Charles F. Middleton, Jr., Sudbury, Mass., assignor to Modicon Corporation, Andover, Mass.

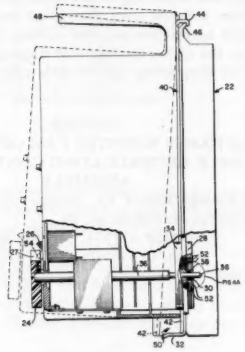
Filed Apr. 23, 1974, Ser. No. 463,315
Int. Cl.² H01H *9/20*
U.S. Cl. 200—50 A **6 Claims**

1. A power-protect interlock system for interconnecting two units comprising:

A. a first unit incorporating

a) a pin-receiving assembly, and
b) a latch-receiving member; and

B. a second unit interconnectible with a power source and comprising
a) a pin-connection assembly positioned for interconnection with said pinreceiving assembly,
b) a movable latch positioned for locking interconnection with said latch-receiving member of said first unit,
c) a power switch having a power-on position and a power-off position, and



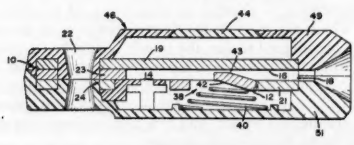
d) a knob
1) incorporating latch connecting means for controlled movement of said movable latch,
2) movable from a first latch open position to a second latch closed position, and
3) positioned for cooperative interaction with said power switch to prevent movement of said power switch when said knob is in its first position and to prevent movement of said knob when said power switch is in its ON position; whereby said pin assemblies are exposed to power only when interconnected.

3,919,508

BUCKLE HOUSING

Dornis Levasseur, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,913
Int. Cl. A44b *11/26*; H01h *3/16*
U.S. Cl. 200—61.58 B **7 Claims**



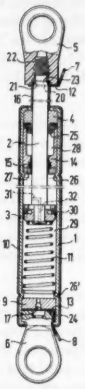
1. A safety belt buckle having a housing therein, said housing having an opening therein and provided with a cavity extending from said opening to a wall of said housing opposite said opening, inlet means communicating with said cavity for receiving the tongue of a seat belt, connecting means for connecting the housing to the seat belt, movable latching means for engaging said tongue, and manually operable actuation means for actuating said latching means, said housing formed of at least three laminated plates in contact with one another and secured together, said laminated plates including a first plate, a second plate, and a third plate, said second plate disposed between said first plate and said third plate, each of said plates having an opening in the central portion thereof, said openings in substantial alignment with one another, at least said second plate having a slot therein extending from an edge of said second plate into the central opening thereof for receiving said tongue, a portion of said latching means extending in and movable within said openings of at least said second plate and said third plate, a portion of said actuating means extending in and movable within said opening of at least said first plate, said second plate having guide means for guiding said tongue into said housing, said guide means having spaced apart, approximately parallel walls.

3,919,509

ELECTRICALLY CONDUCTIVE PNEUMATIC SPRING WITH DOOR ACTUATED SWITCH MEANS

Klaus Schnitzius, Rheinbrohl, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed June 24, 1974, Ser. No. 482,645
Claims priority, application Germany, June 28, 1973, 2332791
Int. Cl.² H01H *3/16*, *35/38*
U.S. Cl. 200—61.62 **10 Claims**



1. A pneumatic spring comprising:
(a) a cylinder member having an axis and formed with a cavity;
(b) a piston assembly axially movable relative to said cylinder member between two end postions, said assembly including
(1) a piston axially separating two compartments in said cavity, and
(2) a piston rod member fixedly fastened to said piston and axially projecting from said cavity in sealing engagement with said cylinder member;
(c) a body of gas in said cavity and impeding axial movement of said piston assembly;
(d) fastening means on respective, oppositely spaced, axially terminal portions of said cylinder member and of said piston rod member outside said cavity for fastening said members to respective objects and including insulating means for electrically insulating said members from the respective fastened objects;
(e) respective electrically conductive terminals mounted on said cylinder member and on said piston rod member outside said cavity; and
(f) electrically conductive means in said cavity conductively connecting said terminals in one of said end positions of said piston assembly.

3,919,510
ELECTRICALLY CONTROLLED SHIFT MECHANISM FOR MARINE PROPULSION UNITS

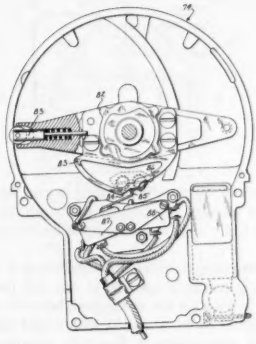
Russell J. Barnes, Oakfield, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 29, 1973, Ser. No. 364,528

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H01H *3/42*

U.S. Cl. 200—61.88 **14 Claims**



1. In marine propulsion drive apparatus having a forward drive means and a reverse drive means controlled by an electrical control means having three inputs and operable to move to three corresponding shift positions including a neutral position, a forward drive position and a reverse drive position comprising a power supply means, a first shift switch means having a power input means connected to the power supply means with a snap action construction movable between first and second output means, a second shift switch means having a power input means connected to said first output means and having a snap action construction movable between third and fourth output means, circuit means connecting said second, third and fourth outputs one each to each of said three inputs of said control means to produce a neutral output, a forward drive output and a reverse drive output, and a manual control unit movable between a neutral position, a forward position and a reverse position and coupled to the shift switch means to selectively and sequentially actuate said switch means to energize only one of said second, third or fourth outputs and establish the corresponding drive position.

3,919,511
HIGH-VOLTAGE APPARATUS SUCH AS A CIRCUIT BREAKER OR THE LIKE EQUIPPED WITH MEANS FOR PREVENTING IMPAIRMENT OF THE ELECTRIC FIELD WITHIN THE APPARATUS ENCLOSURE

Dieter Noack, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

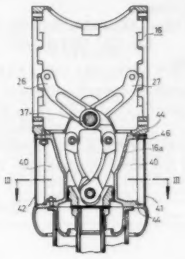
Filed May 29, 1973, Ser. No. 364,274

Claims priority, application Germany, May 31, 1972, 2227330

Int. Cl. H01h *33/82*

U.S. Cl. 200—148 R **5 Claims**

1. In a high-voltage apparatus such as a compressed-gas circuit breaker or the like having an enclosure wherein an electric field is present when the breaker is in service, a reinforced housing arrangement for accommodating the drive mechanism for actuating the contacts of the breaker, the housing arrangement being at high-voltage potential when the breaker is in service and being arranged within the enclosure, the housing arrangement comprising a housing member disposed in surrounding relation to the drive mechanism, a plurality of reinforcement ribs provided on at least the outer surface of said housing member, at least two shell-like members made of electrically conductive material, said shell-like members conjointly forming a hollow cylinder and being



arranged in surrounding relation to said outer surface of said housing member whereby impairment of the electric field within the enclosure is precluded, and fastening means for self-holding and shell-like members to said housing member.

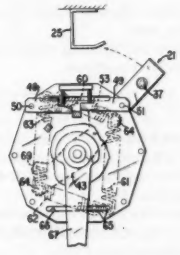
3,919,512
SPRING ACTUATED ELECTRIC SWITCH WITH PARTICULAR LATCHING DOG ARRANGEMENT

Dick Ray, deceased, late of Tulsa, Okla., and Gene R. Stevens, Milwaukee, Wis.

Filed Oct. 30, 1972, Ser. No. 302,019

Int. Cl. H01h *21/42*, *3/30*

U.S. Cl. 200—153 SC **6 Claims**

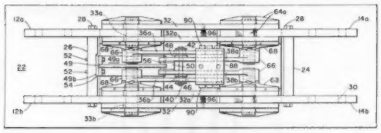


1. In an electric switch mechanism, the combination including frame means, switch blade means including spaced blades pivotally mounted on said frame, stationary switch contact means engageable with said switch blade means, stored energy operating means in said frame means including a pair of spaced plates and a shaft extending therebetween and projecting outwardly therefrom, stationary lug means on said frame, a pair of latching dogs pivoted at their opposite ends to one of said plates on either side of and engageable with said latching dogs for holding said operating means from movement until said latching dogs are released and for controlling movement in either direction, switch handle means arranged on said shaft, a spring arm mounted on and rotatable by said shaft, a series of spring means connected to opposing ends of said spring arm, the outer ends of said spring means being connected to pin means slidably arranged in slot means in one of said plates, said switch handle means being rotated to move said switch blade means relative to said switch contact means and to rotate said plates, spring arm and latching dogs therewith to release said latching dogs from said stationary lug means, whereby at a predetermined position of said handle means said spring arm will be released from said lug means and said spring means will abruptly move said switch blade means relative to said contact means.

3,919,513
CLAMPING MECHANISM FOR BOLTED CONTACT SWITCH

Bernard L. Phillips, Norwood, Mass., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed Mar. 18, 1974, Ser. No. 451,837
Int. Cl.² H01H 1/50
U.S. Cl. 200—256 15 Claims



6. A switch comprising, in combination,

blade means including a pair of conductive members with facing surfaces thereof relatively movable in a direction transverse thereto for making current-carrying contact with a fixed conductive member forming a terminal and a first cam surface portion facing in said direction outwardly from said pair of members and being restrained from rotation relative thereto,

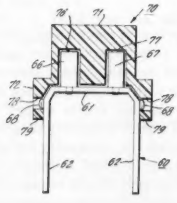
bolt means including a bolt portion having an axis extending in said direction, a nut portion threaded on the bolt portion and a second cam surface portion in rotatably slidable contact with said first cam surface portion, said bolt and nut portions being adapted upon relative rotation to vary the pressure of said contact between said pair of members, one of said bolt and nut portions being restrained from rotation about said axis and the other being restrained from rotation relative to said second cam surface portion, and

clamping means for rotating about said axis said other of said bolt and nut portions.

3,919,514
RETAINING MEANS FOR CIRCUIT BREAKER HANDLE

Albert Strobel, Cherry Hill, N.J., and Anthony B. Michetti, Warminster, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed May 13, 1974, Ser. No. 469,120
Int. Cl.² H01H 9/08, 3/02
U.S. Cl. 200—331 8 Claims

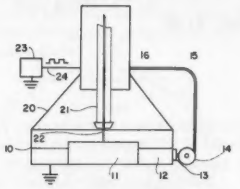


1. A circuit breaker including a housing having an openable cover, cooperating contact means disposed within said housing, an operating mechanism disposed within said housing and connected to said contact means for opening and closing the later, a molded insulating handle extending through an opening in said cover, a handle extension disposed within said housing in operative engagement with said operating mechanism, first formation means on said handle and second formation means on said extension, said first and second formation means being snap-fitted to each other for securement of said handle to a portion of said extension disposed within said housing whereby said cover may be opened even while said handle is positively held to said extension.

3,919,515
ELECTRODE HOLDER FOR EDM

Joseph F. Bangs, 1601 West Burbank Blvd., Burbank, Calif. 91505

Filed May 29, 1973, Ser. No. 364,602
Int. Cl.² B23B 31/20; B23P 1/08
U.S. Cl. 219—69 E 4 Claims



1. An electrode holder for holding a rod like electrode having an axial passage throughout its length, said electrode being adapted to be used in an electron discharge machining comprising;

an axially extending tubular body including a conical outward flaring entrance opening at one end thereof, and a threaded portion on the outer periphery of said body;

a collet adapted to be received within said tubular body, said collet constituting a generally tubular electrically conductive body having an end portion and a conical flange portion adjacent to the outermost end thereof dimensioned to engage the conical entrance opening of said tubular body;

a ring shaped chuck means including internal threads for engaging the threaded portion of said tubular body and including an internal surface engaging said collet end portion for selectively applying or releasing clamping force between said collet and said body at said engaging conical portions;

said collet having an axial bore therethrough dimensioned to hold an electrode of circular cross section therein;

said collet including at least one longitudinal slot therethrough extending from the outermost end thereof along the axis of said axial bore for a portion of the length of said axial bore;

said bore having a length in the order of at least 10 times its diameter said diameter being sufficient to provide a slip fit with an electrode positioned therein with said chuck means in clamping force releasing condition;

the elongated contact between the inner wall of said collet defining said bore and the surface of electrode positioned therein, defining a fluid tight seal therebetween; and

means for applying fluid to the bore of said tubular body.

3,919,516
MOTION TRANSLATION MECHANISM FOR THE TOOL DRIVE OF A MACHINING EQUIPMENT

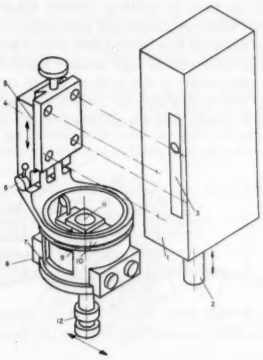
Werner Ullmann, Locarno; Bernd Schumacher, Losone; Peter Marti, Losone, and Caspar Vasalli, Losone, all of Switzerland, assignors to AG fur Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Dec. 14, 1973, Ser. No. 424,716
Claims priority, application Switzerland, Sept. 27, 1973, 13877/73
Int. Cl.² B23K 9/16
U.S. Cl. 219—69 E 10 Claims

1. Drive converting apparatus for a machine tool advancing drive of an electro-erosion machine, said tool advancing drive being controllably operable back and forth in one linear direction, being mounted on a drive head and having a controlled motor and a tail spindle axially driven by said motor relative to said drive head, said drive converting apparatus comprising:

a housing (7) mounted on said drive head;

means for adjusting the position of said housing relative to said drive head in at least one of the following modes of relative displacement, namely, translation in said linear direction of said drive, rotation about the axis of said tail spindle, and adjustment of a shiftable fixation permitting adjustable deviation of an axis of said housing from parallelism to the axis of said tail spindle, said axis of said housing being alignable by said adjusting means for such parallelism when no deviation therefrom is desired;



a carriage (8) carried by said housing (7), and guide means for permitting movement of said carriage which is transverse to the axis of said tail spindle when said axis of said housing is aligned as aforesaid, said carriage having chuck means mounted thereon for holding a tool electrode (12), and

movement conversion means (11) in said housing (7) for translating the movement of said tail spindle produced by said drive, in a manner substantially free from backlash, into a movement of said carriage (8) along said guide means.

3,919,517

SUB-MERGED WELDING METHOD FOR HIGH TOUGHNESS WELDED METAL

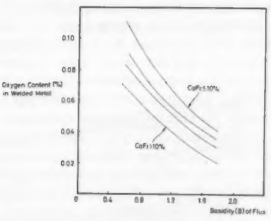
Keizo Ishizaki, Tokyo, and Sigeo Fujimori, Machida, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 2, 1973, Ser. No. 347,166

Claims priority, application Japan, Apr. 1, 1972, 47-32814

Int. Cl.² B23K *9/18*

U.S. Cl. 219—73 **1 Claim**



1. A sub-merged arc welding method which comprises applying one-side or each-side pass welding of a high grade line pipe steel with high notch toughness using a high basicity fusion-type flux containing more than 10% of CaF_2 and having a basicity determined by the formula: 0.108 CaO (%) + 0.068 MnO (%) + 0.10 MgO (%) / 0.105 SiO_2 (%) + 0.002 Al_2O_3 (%) of 1.2 to 1.8, in combination with a welding wire consisting essentially of not more than 0.10% of carbon, not more than 0.50% of silicon, 0.8 to 2.4% of manganese, not more than 0.80% of molybdenum, 0.30 to 0.60% of titanium, and less than 0.0020% of boron, with the balance being iron and unavoidable impurities to produce a weld metal with very high notch toughness.

3,919,518

DEVICE FOR LABELLING OBJECTS SUCH AS BLOOMS

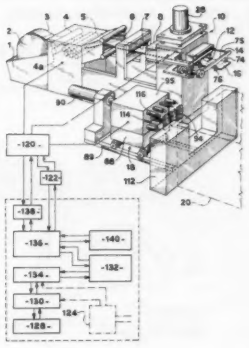
Jean-Pierre Volat, Marseille, France, assignor to Union Siderurgique du Nord et de l'Est de la France par abreviation "USINOR", Paris, France

Filed Sept. 18, 1973, Ser. No. 398,527

Claims priority, application France, Jan. 26, 1973, 73.02757

Int. Cl.² B23K *11/10*

U.S. Cl. 219—80 **17 Claims**



1. A machine for labelling an object a high temperature by means of a label welded to the object, comprising in combination: a magazine storing a band of weldable material, a marking device for receiving said band from said magazine and deforming the material of said band and thereby marking information on a portion of said band, a tool for cutting said portion off from said band and thereby constituting a label, a welding station comprising means for receiving said object and means for welding the label to said object in a plurality of regions of the label, and a label-holding system comprising a deformable heat-insulating screen, means for transferring the label from the marking device to said welding station and interposing the label between the screen and said object, means for producing a relative movement between said object and the screen and between said object and said welding means so as to apply the label against the surface of said object by means of the screen and bring said welding means into position for welding the label to said object, the screen being capable of extending over almost the whole of the label so as to cause the label to conform to the shape of the surface of said object upon said relative movement between said object and the screen.

3,919,519

WELDING MATERIAL

Walter Adrian Petersen, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 221,400, Jan. 27, 1972, Pat. No. 3,770,427. This application July 27, 1973, Ser. No. 383,380

Int. Cl. B23k *9/02*

U.S. Cl. 219—137 **1 Claim**

1. A method of producing relatively crack-free, corrosion-resistant weld joints between metal pieces wherein at least one of the pieces to be joined by welding contains about 28%

chromium, about 10% iron, and the balance essentially nickel and incidental constituents, said method comprising gas-shielded arc welding said pieces with filler metal consisting essentially of, by weight, about 27% to about 31.5% chromium, about 5% to about 14% iron, about 0.5% to about 1.1% aluminum, about 0.1% to about 0.7% titanium, up to about 0.1% magnesium, about 0.05% to about 5% manganese, about 0.02% to about 0.08% carbon, up to about 0.3% silicon, up to about 0.5% copper, up to about 0.030% nitrogen, up to about 0.1% zirconium, up to about 6% cobalt, up to about 2% molybdenum, up to about 2% tungsten, up to about 0.01% each of phosphorus and sulfur and the balance essentially nickel.

3,919,520

ENGINE PREHEATER

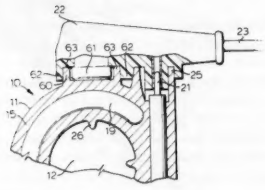
Bernard H. Pickard, Toronto, Canada, assignor to Bardon Research and Development Limited, Toronto, Canada

Continuation-in-part of Ser. No. 159,816, July 6, 1971, abandoned. This application Jan. 5, 1973, Ser. No. 321,455

Claims priority, application Canada, June 30, 1971, 117060; June 30, 1972, 76680

Int. Cl. F02n *17/04;* **F24h** *1/10;* **H05b** *1/02*

U.S. Cl. 219—208 **15 Claims**



1. A heater for the coolant of a liquid cooled engine, said heater being of a type adapted to be connected in a hose between a liquid cooled engine and a radiator, said heater comprising a housing having a passage extending therethrough for passage of coolant through said heater, said housing having first and second end sections and an intermediate section, said intermediate section being cast of heat conductive material and being located between said end sections, said end sections being adapted to be connected to a radiator hose, an electric heating element cast in place in and embedded in said intermediate section and separated from the passage through said housing by a part of said housing, whereby coolant flowing through the passage in said housing is inhibited from direct contact with said heating element but indirectly is heated thereby, a thermostat located in heat transfer relationship with said housing on the side of said heating element remote from said passage, said thermostat being responsive to the temperature of said heating element for interrupting the supply of power thereto when the temperature sensed by said thermostat exceeds a predetermined upper limit, and a plug adapted for electrical connection to said heating element, said thermostat being incorporated in said plug.

3,919,521

IGNITION PLUG FOR ELECTRIC CIGARETTE LIGHTER

Mitsuru Iwao, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Mar. 29, 1974, Ser. No. 456,293

Claims priority, application Japan, Apr. 3, 1973, 48-40410[U]

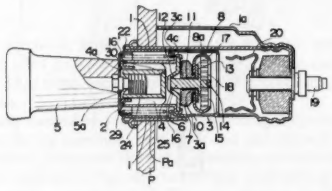
Int. Cl.² F23Q *7/22*

U.S. Cl. 219—267 **13 Claims**

1. An ignition plug for an electrical cigarette lighter adapted to be inserted into a socket for energization and removable from said socket for use in lighting cigarettes comprising:

a unitary assembly including, at one end thereof, an elongated connecting member of polygonal cross section extending through an electric heating unit, said electric heating unit including an ignition coil connected to one end of said connecting member, a cup connected to and surrounding said ignition coil, an insulating spacer and an end plate, each of said cup, insulating spacer and end plate having a centrally disposed opening adapted to pass said connecting member therethrough and shaped to conform to the cross section of said polygonal connecting member so that no relative motion takes place among said cup, insulating plate and end plate, and

means for fixing an insulating knob to said unitary assembly at an opposite end of said unitary assembly, said fixing means comprising a nut formed on its outer peripheral surface with a plurality of projections which extend in parallel to each other spaced at equal distances about the



axis of said nut and which also extend in parallel to the axis of said nut, a centrally disposed opening with a brim which is formed on corresponding end of an inner sleeve of said unitary assembly, and which is shaped with notches to conform to the cross section of said nut, said opening having a short tongue bent at right angles to a surface of said brim axially inwardly extending into the sleeve from an inner edge of one notch and a long tongue similarly bent at right angles to said surface of said brim axially inwardly extending into the sleeve from an inner edge of another notch so that, when said nut slightly engaged with a threaded stud of said knob through which a mounting plate is inserted is passed into said opening with subsequent further turning of said knob, said long tongue engages said projections and is prevented from rotation, resulting in rigid engagement between said knob and said unitary assembly.

3,919,522

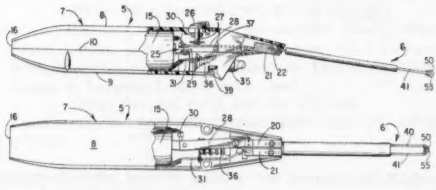
CORDLESS ELECTRIC IGNITION TOOL

John F. Wahl, and Roy E. Meyer, both of Sterling, Ill., assignors to Wall Clipper Corporation, Sterling, Ill.

Filed Apr. 22, 1974, Ser. No. 462,871

Int. Cl.² F23Q *7/16;* **H05B** *1/00*

U.S. Cl. 219—268 **4 Claims**



1. A cordless electric ignition tool, comprising:

a housing;

a battery in said housing;

a pair of adjacent terminals electrically insulated from each other in said housing and electrically connected to said battery;

a normally open switch in said housing in circuit with said battery and said terminals;

a pair of elongated unitary electrical conductors electrically connected to said terminals and extending therefrom away from said housing, said conductors capable of retaining shape at high temperature;

a supporting member of heat resistant, electrically insulating material having spaced openings, the free ends of said conductors being received within said openings whereby the supporting member is supported at the free ends of the conductors;

resistance heating wire on said supporting member electrically connected to said conductors, said heating wire on closure of said switch heating to a temperature above **1400** degrees F.;

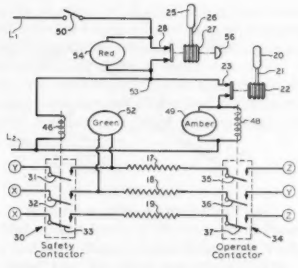
tubes of electrically conducting material on said elongated unitary electrical conductors extending the major part of the length of said conductors and in electrical contact therewith for stiffening said conductors and for additional conductivity; and

electrical insulating material between and enclosing said conductive tubes.

3,919,523
ELECTRIC COOKING APPARATUS WITH SAFETY CONTROL

Gurinder S. Wadia, Carpentersville, and Harnek S. Gill, Algonquin, both of Ill., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Dec. 23, 1974, Ser. No. 535,572
Int. Cl.² H05B *1/02*
U.S. Cl. 219—494 **6 Claims**

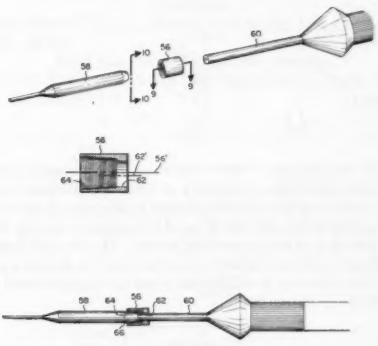


1. In an electric cooking unit having electric heating elements disposed to heat a cooking environment, an improved operating-safety circuit comprising main on and off switch means, an operating contactor and a safety contactor each including normally open switch contacts and an actuating coil effective for closing same, an operating thermostat and a safety thermostat each having a heat sensor in the cooking environment and each having normally closed contacts opened responsive to the sensed set high temperature, means connecting the operating contactor switch contacts and the safety contactor switch contacts on opposite sides of and in main power series circuits with the heating elements effective for controlling electric input to same, an operate control including means connecting the main on and off switch means operatively in series with a parallel hookup connection of the safety contactor actuating coil as one leg and the serially connected operator contactor actuating coil and operating thermostat controlled contacts as the other leg, so that actuation of said main on and off switch means simultaneously energizes and deenergizes both actuating coils and thereby opens and closes the switch contacts of both contactors, a safety control including means connecting the safety thermostat controlled contacts operatively with the power series connection through said mentioned parallel hookup connection and in series with the main on and off switch means operable responsive to the opening of said contacts for simultaneously deenergizing the actuating coils of both contactors, means effectively holding said parallel hookup connection open and manual reset means for releasing the said holding means, and a signal device hooked across the main power input lines at locations between the safety contactor switch contacts and heating elements effective to indicate both a power on condition and a faulted closed condition of the safety and operating contactor switch contacts.

3,919,524
SOLDERING TIP AND LOCKING APPARATUS COMBINATION

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Division of Ser. No. 388,928, Aug. 16, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,402
Int. Cl.² H05B *1/00*; B23K *3/02*; B25G *3/24*
U.S. Cl. 219—238 **2 Claims**



1. Soldering tip locking apparatus comprising:

soldering tip element of the character having a forward tip end and a rear, hollow cylindrical skirt portion for closely fitting over an elongated cylindrical heating rod member; and

collar element having a short, hollow, substantially cylindrical section with an inner diameter slightly greater than the outer diameter of the end of said rear, hollow skirt portion of said tip element,

at least one of the outer surface of said skirt portion and the inner surface of said cylindrical section of said collar element being effectively tapered whereby axial displacement of said collar element over said skirt portion in the direction toward the said tip end of said tip element establishes contact between said collar element and said skirt portion, and whereby further such displacement establishes radially inwardly directed force upon said skirt portion, and

at least one of said outer surface and said inner surface being threaded whereby said axial displacement is effected by rotational motion of said collar element about the axis of said heating rod member with respect to said tip element;

said collar element further including a forward internally tapered portion, the inner diameter of which is essentially symmetrical about central axis of the collar and the taper of which diverges conically forwardly; and a rear portion having an opening, the diameter of which is slightly greater than the outer diameter of said heating rod member, the center of the opening of said rear portion of said collar element being disposed eccentrically with respect to said central axis of said collar element, said tapered portion having a front diameter greater than the outer diameter of said skirt portion and a rear diameter slightly greater than the diameter of said heating rod.

3,919,525
VAPORIZER APPARATUS FOR VAPOR DEPOSITION EQUIPMENT

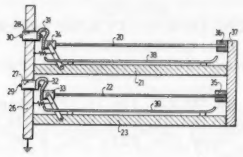
Karl Kerner, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

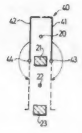
Filed Jan. 28, 1974, Ser. No. 437,318

Claims priority, application Germany, Feb. 24, 1973, 2309405

Int. Cl.² F22B *1/28*

U.S. Cl. 219—271 **8 Claims**





1. In an elongated vapor deposition high vacuum vessel, a vaporizer apparatus comprising at least two elongated vaporizing means capable of being heated by the passage of electric current therethrough (**20, 22**) and an elongated current return lead for each of said vaporizing means (**21, 23**), said vaporizing means and said current return leads being disposed parallel to the direction in which said vessel is elongagted and lying substantially in one plane.

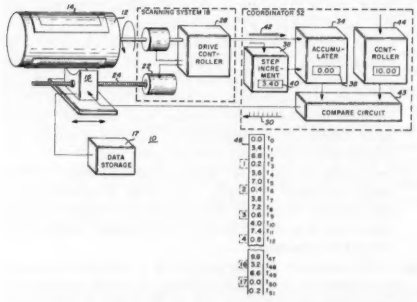
3,919,526
SAMPLE RATE COORDINATOR AND DATA HANDLING SYSTEM

Ansis Pommers, Sunnyvale, and Robert W. Lotz, Mountain View, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,273

Int. Cl. G06k *7/00;* **H03k** *13/02*

U.S. Cl. 235—61.6 A **10 Claims**



1. An apparatus for converting existing data into digital form, comprising:

annular rotating display means adapted to display the existing data;

sampling means for reading the existing data when activated;

scanning means for establishing relative motion between the existing data on the annular display means and the sampling means; and

an accumulator for holding an intermediate number which changes in magnitude by steps in response to the scanning means, each time the intermediate number changes by a required amount the accumulator activates the sampling means.

3,919,527
OMNIDIRECTIONAL OPTICAL SCANNER

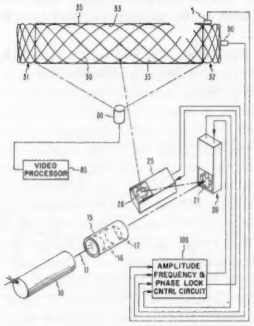
Arlen J. Bowen; LeRoy D. Dickson; Jerome A. Goretzki; Kenneth E. Hendrickson; Donald P. King; Terrance W. Kueper, and Ronald L. Soderstrom, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 26, 1973, Ser. No. 382,783

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G06K *7/10;* **G08C** *9/06*

U.S. Cl. 235—61.11 E **8 Claims**



5. An omnidirectional scanning system for scanning coded labels on randomly oriented articles transported along a path through a scanning station comprising

a scan window positioned in the plane of said transport path;

light source means for providing a beam of light having a predetermined width;

first light beam deflector means oscillating at a first predetermined frequency and positioned to deflect said light beam away from said light source and in a first direction relative to said scan window;

second light beam deflector means oscillating at a second predetermined frequency and positioned to deflect the light beam deflected by said first deflector means in a second direction relative to said scan window whereby said deflected light beam moves along a path inside and outside of said scan window so that path in said scan window appears as a series of interlaced X's;

first oscillating means for oscillating said first beam deflector means at said first predetermined frequency;

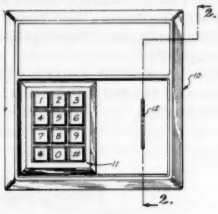
second oscillating means for oscillating said second beam deflector means at said second predetermined

means for locking said first and second oscillating means in phase and frequency.

3,919,528
METHOD AND APPARATUS FOR OPERATING AUTHORIZATION CONTROL SYSTEMS

Irving B. Cooper, Marblehead, Mass.; Joseph V. Gurrieri, Rocky Hill, Conn., and Michael J. Lord, Lincoln, Nebr., assignors to Notifier Company, Lincoln, Nebr.

Continuation of Ser. No. 268,197, June 30, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,260
Int. Cl.² G06K *7/08, 19/06;* **G07F** *1/06;* **H01F** *15/02*
U.S. Cl. 235—61.11 A **13 Claims**



4. A method of verifying the correctness of binary coded data, said method comprising the steps of

transmitting said data to a decoding matrix,

decoding said data corresponding to the correctness of at least one decimal digit of said binary coded data by comparing said decimal digit with a preselected correct number,

counting the total number of said decimal digits in said binary coded data,

counting the number of decimal digits that were decoded and indicated as being correct by said decoding step,

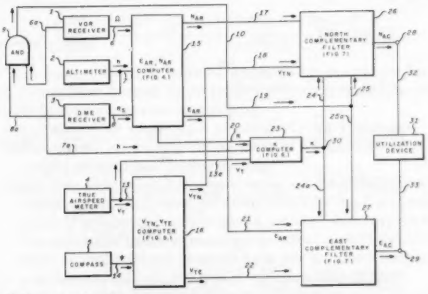
comparing the total number of decimal digits with a total number of correct decimal digits, and

producing an output indicating the correctness of said code when said total number of decimal digits correlates with said total number of correct decimal digits in a preselected manner.

3,919,529
RADIO NAVIGATION SYSTEM

Donald H. Baker, and Larry J. Bowe, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,228
Int. Cl.² G01S *7/44;* **G06F** *15/50*
U.S. Cl. 235—150.27 **30 Claims**



1. In a navigation computer:

signal input means for developing a difference signal with respect to a radio derived signal representing a component of range and a signal representing a computed value of said component of range,

first multiplier means for selectively multiplying said difference signal by a signal representing craft true air speed to form a velocity component signal,

means for summing said velocity component signal and the time integrated value thereof to form a first composite velocity signal,

first integrator means for time integrating said first composite velocity signal along with a signal proportional to the output of said first integrator means,

summation means responsive to said first integrator means and to a signal representing a component of craft true air speed for forming a second composite velocity signal,

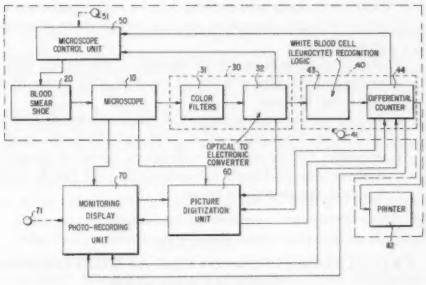
second integrator means for time integrating said second composite velocity signal for forming said signal representing said computed value of said component of range and,

coupling means for feeding said signal representing said computed value of said component of range back to said signal input means for developing said difference signal.

3,919,530
COLOR INFORMATION LEUKOCYTES ANALYSIS SYSTEM

George Chiwo Cheng, 2220 SW. 34th St. No. 106, Gainesville, Fla. 32608

Filed Apr. 10, 1974, Ser. No. 459,781
Int. Cl.² A61B *5/14;* **G01J** *3/48;* **G01N** *21/24;* **G02F** *1/25*
U.S. Cl. 235—151.3 **11 Claims**



1. An apparatus for performing leukocyte analysis, comprising:

a microscope for providing an output representing a specimen under test;

a color spectrum analyzer responsive to said output of said microscope for producing electronic signals representing a function of the color spectrum of said microscope output, said color spectrum analyzer comprising, a plurality of color spectrum filters based on empirically determined Leukocyte related color spectrum characteristics and an optical to electronic converter responsive to said color filters;

a computer responsive to said color spectrum analyzer for producing electronic data representative of predetermined color spectrum characteristics of said specimen; and

means responsive to said computer for providing an intelligible record of said electronic data produced by said computer.

3,919,531
METHOD OF AND APPARATUS FOR INSPECTING THE CONTOURS OF MOVING BENT ARTICLES

Robert J. Bobel, II; Robert B. Kimura, and Robert C. Pollex, all of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

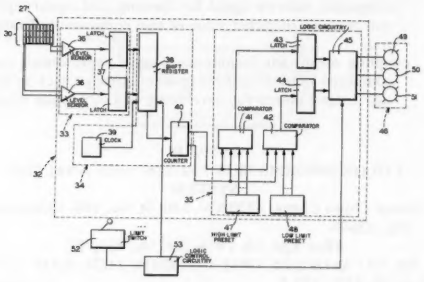
Filed May 16, 1974, Ser. No. 470,593
Int. Cl.² G06F *15/20;* **G07C** *3/14*
U.S. Cl. 235—151.3 **23 Claims**

7. In a method of determining the contour of a bent sheet article moving along a defined path by intercepting a reflected

light beam whose direction changes as it is reflected from the bent article, the improvement comprising the steps of:

a. directing a stationary collimated light beam toward the defined path;

b. moving said bent article along said defined path through said light beam for continuously reflecting said light beam from and along a desired line on said bent article which extends in a plane parallel to the defined path as said article moves therealong;



c. intercepting said reflected light beam as it changes direction from along said desired line by individual ones of an array of light detection devices to produce a series of signals;

d. monitoring said series of signals in the order they are produced by said individual ones of said array of light detection devices;

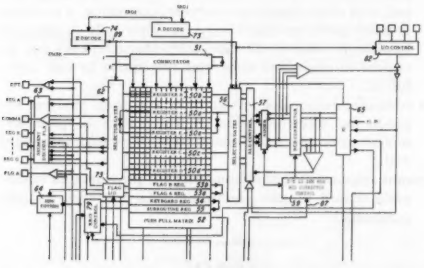
e. accumulating and storing said series of signals until said article has traversed said stationary light beam, and

f. releasing and processing said stored series of signals into a predetermined logic subsequent to said article traversing said directed light beam.

3,919,532
CALCULATOR SYSTEM HAVING AN EXCHANGE DATA MEMORY REGISTER

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 13, 1973, Ser. No. 397,185
Int. Cl.² G06F *13/00*
U.S. Cl. 235—156 **5 Claims**



1. In an electronic calculator system implemented on at least one semiconductor chip, having a clock system for providing cycle and sub-cycle timing, input means for receiving data, an arithmetic unit, and control means responsive to the clock system and to a decoded instruction word for causing the arithmetic unit to operate on the data, the combination comprising:

a. N data storage means for storing N multi-digit, multi-bit data words received, at least in part, from the input means;

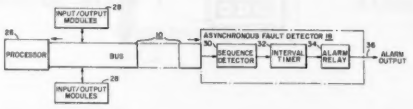
b. exchange storage means for storing another multi-digit, multi-bit data word, selectively coupled only to one of the N data storage means; and

c. selector means responsive to the control means and operatively connected to the N data storage means and to the exchange storage means to cause an exchange of data words between the exchange storage means and the one N data storage means.

3,919,533
ELECTRICAL FAULT INDICATOR

Charles W. Einolf, Jr., Export, and James A. Neuner, Gibsonia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 8, 1974, Ser. No. 522,191
Int. Cl.² H04B *3/46;* **G06F** *11/04*
U.S. Cl. 235—153 AC **14 Claims**



1. A fault indicator for continually monitoring the operation of electrical apparatus comprising:

means for supplying a predetermined coded output signal in a preselected sequence periodically when the apparatus monitored is functioning properly;

means responsive to the proper presentation of the coded output in the preselected sequence to provide a decoded output signal;

a timer operable to provide an output for a predetermined time interval and responsive to the decoded output to reinitiate the time interval;

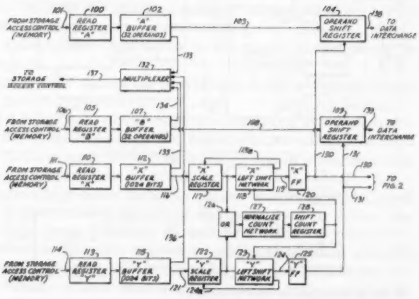
means for providing a fault output; and

means responsive to the timer output to prevent the fault output means from providing an output during the running of the predetermined time interval.

3,919,534
DATA PROCESSING SYSTEM

Maurice L. Hutson, and Kurt Erben, both of St. Paul, Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 17, 1974, Ser. No. 470,896
Int. Cl.² G06F *7/38*
U.S. Cl. 235—156 **30 Claims**



1. Apparatus for aligning corresponding operands of first and second operand sparse vectors wherein a first order vector comprises a first string of successive bits and a second order vector comprises a second string of successive bits, the bits of said order vectors each having a first binary value whenever the corresponding term of a corresponding operand

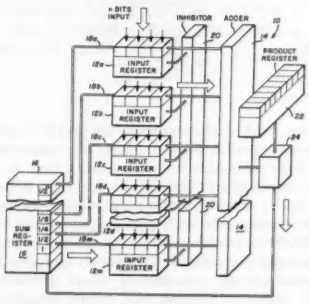
vector represents a non-zero value and having a second binary value whenever the corresponding term of the corresponding operand vector represents a zero value, said apparatus comprising: logic means for processing said first and second order vectors to provide first and second gate signals, said logic means including network means for sequentially shifting successive bits of said first and second order vectors, first generating means connected to said network means for generating said first gate signal whenever the network means shifts a bit having said first binary value in said first order vector to said first generating means, and second generating means connected to said network means for generating said second gate signal whenever the network means shifts a bit having said first binary value in said second order vector to said second generating means; and gatable register means for storing operands of said first and second sparse vectors, said register means having an output and being responsive to a first gate signal to supply an operand from said first sparse vector to said output and being responsive to a second gate signal to supply an output from said second sparse vector to said output.

3,919,535

MULTIPLE ADDEND ADDER AND MULTIPLIER

Evor S. Vattuone, San Jose, Calif., assignor to The Singer Company, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,340
Int. Cl.² G06F *7/50, 7/54*
U.S. Cl. 235—164 **13 Claims**



1. A binary, multiple addend, adder-multiplier circuit having a multiplier formed by powers-of-two components having whole integer exponents, comprising:

input means for receiving a plurality of binary addends;

adder circuit for adding the plurality of addends forming a binary addend sum multiplicand;

displacing circuit for forming a series of the multiplicand, each multiplicand member of the series having the binary point displaced a predetermined amount with respect to the other multiplicand members to effect a multiplication of each multiplicand member by a power of two forming a series of multiplicand power-of-two products; and

means for selecting among the multiplicand power-of-two products those which are components of the multiplier to form a series of multiplicand power-of-two components which are added together by the adder circuit to provide the product of the addend sum multiplicand times the multiplier; and

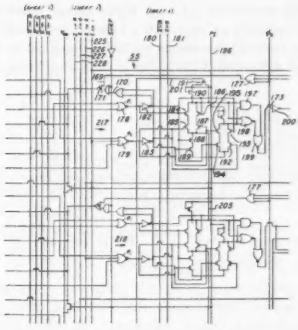
output means for receiving the sum of the multiplicand power-of-two components.

3,919,536

PRECHARGED DIGITAL ADDER AND CARRY CIRCUIT

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 13, 1973, Ser. No. 397,048
Int. Cl.² G06F *7/50*
U.S. Cl. 235—174 **7 Claims**



1. In a calculator system having a system clock for providing a plurality of clock phases, having data memory means for storing in parallel a plurality of multi-bit data words, having arithmetic logic means divided into a plurality of stages, each stage coupled to the data memory means for receiving a selected pair of bits for executing arithmetic and logic operations in bit parallel-digit serial format and selectively connected to a precharge source, each stage comprising:

a. a precharge terminal;

b. means for precharging the precharge terminal to a reference potential during one phase of the system clock by selectively connecting the precharge terminal to the precharge source;

c. a carry propagate circuit connected to the precharge terminal and having an output terminal, the precharge terminal being connected to receive a carry input signal, the circuit including discharge means for selectively discharging at a subsequent clock phase the precharge terminal, responsive to the logic level of the carry input signal and further responsive to the logic levels of the selected pair of bits;

d. a signal terminal;

e. means for precharging the signal terminal during the one phase of the clock by selectively connecting the signal terminal to the precharge source; and

f. an adder circuit connected to the signal terminal and including adder discharging means for selectively discharging the signal terminal at a subsequent clock phase responsive to the logic levels of the selected pair of bits and to the logic level of the carry input signal.

3,919,537

DIFFERENTIATOR AND VARIABLE THRESHOLD GATE CIRCUIT

Byron G. Bynum, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 286,386, Sept. 5, 1972, Pat. No. 3,857,612. This application Mar. 4, 1974, Ser. No. 448,089
Int. Cl.² H03K *5/20*
U.S. Cl. 235—183 **7 Claims**

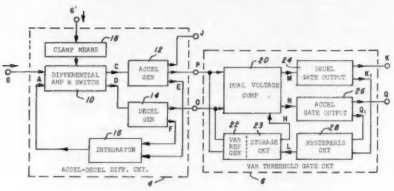
1. An electronic differentiator circuit for providing the mathematical derivative of an input signal comprising in combination:

differential amplifier means having a pair of inputs for respectively receiving said input signal at a first input and

a feedback input signal at a second input and being responsive to said input signal and to said feedback input signal for providing first and second differential output signals indicative of the amplitude difference between said input signal and said feedback input signal;

positive current generator means connected to the output of said differential amplifier means and being responsive to said first differential output signal for providing a positive differentiator output signal proportional to the mathematical derivative of said input signal when said input signal exhibits an increasing rate of amplitude change;

negative current generator means connected to the output of said differential amplifier means and being responsive



to said second differential output signal for providing a negative differentiator output signal proportional to the mathematical derivative of said input signal when said input signal exhibits a decreasing rate of amplitude change; and

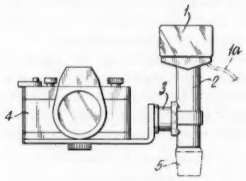
integrator circuit means coupled to the outputs of said positive and negative current generator means for mathematically integrating said differentiator output signals therefrom, and the output of said integrator circuit means being connected to the second input of said differential amplifier means for providing said feedback input signal to have a magnitude substantially equivalent to the magnitude of said input signal.

3,919,538

BRACKET TYPE ELECTRONIC FLASH DEVICE

Kotaro Yata, Ikeda, and Hiroshi Ueda, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 4, 1974, Ser. No. 438,958
Claims priority, application Japan, Feb. 9, 1973, 48-16258
Int. Cl.² G03B *15/05*
U.S. Cl. 240—1.3 **5 Claims**



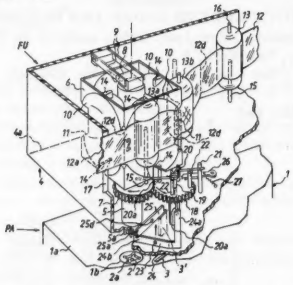
1. An electronic flash device comprising a head and a grip portion and being alternatively powered by self contained batteries or an external power source, and characterized in that said grip portion is divided into a main part and a secondary part which is detachable from said main part; said main part of the grip portion being fixedly connected at one end to said head portion for forming a main body of said device which includes means for connection to the external power source, and a bracket means mounted on said main part for coupling the device to a camera, said main part of the grip portion at the other end being provided with a first connecting member and a first pair of electric terminals; and said secondary part of said grip portion including means for housing the batteries and being provided at one end with a second connecting member separably engageable with said first connecting member for mechanically detachably connecting the secondary part to the main part of the grip portion and a second pair of electric terminals separably coupled with said first pair of electric terminals for supplying said main body with power from the batteries housed in said secondary part of the grip portion through the coupling of the electric terminals.

3,919,539

MULTIPLE FLASH LAMP HOLDER FOR USE WITH PHOTOGRAPHIC APPARATUS

Alfred Winkler; Fridolin Hennig, and Dieter Albrecht, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 1, 1974, Ser. No. 447,331
Claims priority, application Germany, Mar. 8, 1973, 2311420; Mar. 8, 1973, 2311429; Dec. 6, 1973, 2360953
Int. Cl.² G03B *15/04*
U.S. Cl. 240—1.3 **22 Claims**



1. For use with a photographic apparatus having rotary output means indexible through angles of preselected magnitude and impeller means movable from a first to a second position, a source of artificial light comprising a hollow casing having an outlet opening; rotary input means mounted in said casing and connectable with said output means to receive motion therefrom; an elongated flexible carrier of finite length in said casing; a plurality of percussively ignitable lamps secured to said carrier; transporting means provided in said casing and operative to move said carrier lengthwise in response to movement of said input means on indexing of said output means to thereby place successive lamps into a predetermined position, said carrier having a leader which passes from said casing through said outlet opening in response to operation of said transporting means; and impact-transmitting means movable with respect to said casing from an uncocked to a cocked position in response to movement of said input means and back to said uncocked position in response to movement of said impeller means to said second position, said impact-transmitting means having a portion arranged to fire the lamp in said predetermined position in response to movement of said impact-transmitting means to said uncocked position thereof.

3,919,540

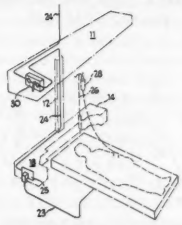
SAFETY LIGHT

Francis J. Burst; Eugene H. Fullenkamp, both of Batesville, Ind.; James H. Scott, Los Angeles, Calif.; David J. Sunderman, Batesville, and L. Dale Foster, Brookville, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Apr. 11, 1974, Ser. No. 459,921
Int. Cl.² F21V *33/00*
U.S. Cl. 240—2 R **12 Claims**

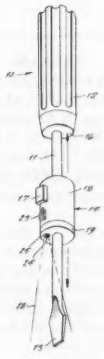
1. A safety light assembly comprising:

a. an elongated horizontal light fixture adapted to be mounted on a wall;
b. a bumper assembly adapted to be attached to a wall below said light fixture and having guide means for locating a hospital bed thereof centrally of said light fixture, said bumper assembly having an electrical outlet for delivering electric energy to said hospital bed;



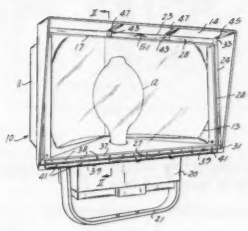
c. an electric circuit adapted for connection to a source of energy and extending through said light fixture to said electrical outlet; and
d. a movable switch in said circuit and carried by said light fixture responsive to interfering movement of said bed with said light fixture to disrupt the supply of electric energy to said bed.

3,919,541
SCREW DRIVER'S LIGHT
Albert A. Chao, 407 Glendale Road, Northvale, N.J. 07647
Filed July 11, 1974, Ser. No. 487,790
Int. Cl.² B43K 29/10; F21V 33/00
U.S. Cl. 240—6.46 **2 Claims**



1. A light for use with a screwdriver having a straight steel shank, a handle on one end of the shank and an opposite end of the shank being flattened into a screwhead slot fitting blade; said light comprising means for illuminating a screw being turned by the blade of the screwdriver, said means comprising a block having a central opening extending therethrough for slidably receiving the shank of the screwdriver, said block carrying a dry cell battery, switch and lamp in electric circuit for producing light rays directed toward the blade of the screwdriver, a permanent magnet embedded within said block having an outer surface protruding from a side of said block for magnetic securement to any steel surface and an inner surface protruding into the opening extending through the block for retaining said block in adjustably selected positions along the shank of the screwdriver.

3,919,542
FLOODLIGHT ASSEMBLY WITH IMPROVED LENS FRAME
William A. Castic, Elk Grove Village, Ill., assignor to North Star Lighting Inc., Berwyn, Ill.
Filed July 3, 1974, Ser. No. 485,603
Int. Cl.² F21V 17/00
U.S. Cl. 240—41.55 **19 Claims**

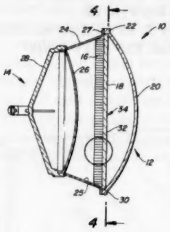


1. In a floodlight assembly including a cavitated housing supporting a lamp and reflector therein and having a light egress opening with an outwardly facing seat thereabout against which a sealing gasket is received, and a closure lens arranged to be closed against the gasket, the improvement comprising:
a resiliently flexible lens mounting frame in the form of an integral lens edge receiving channel and engaging in support relation about the lens and having a split therein with ends in confronting relation and facilitating assembly of the lens with the frame by flexing the frame open sufficiently from a substantially closed loop condition to receive the lens edgewise in the channel structure and then allowing the frame to spring back into the substantially closed loop condition to entrap the lens edgewise in the channel structure;
hinge means on the frame at each side of the split and secured to the housing whereby said ends are held against separating and the frame is maintained in the substantially closed loop condition fixedly on the lens and enabling the lens and the frame as a unit to be swung between open and closed positions relative to said opening and said gasket; and
releasable means for securing the frame in the closed position with the lens and the frame closed against the gasket.

3,919,543
EMERGENCY LIGHT
Don W. Noren, Redwood City, Calif., assignor to Noren Products, Inc., Redwood City, Calif.
Continuation of Ser. No. 380,659, July 19, 1973, abandoned. This application June 24, 1974, Ser. No. 482,386
Int. Cl.² F21V 11/06
U.S. Cl. 240—46.01 **8 Claims**

1. An emergency light which has the appearance of a regular seal-beam type headlight when turned off and viewed under external illumination; but when turned on, has a distinct predetermined color comprising:
a source of light of said predetermined color;
a sleeve adjacent said source of light having an outer end spaced from said source of light, a substantially colorless lens adapted to pass light emanating from said source of light closing the outer end of said sleeve;
light channeling means positioned within said sleeve between said source of light and said lens for requiring light rays passing between said source and said lens to be essentially parallel, said channeling means preventing the influx of outside light tending to expose said source of light of said predetermined color; and,
a beam splitter means comprising a one way mirror surface

having a multiplicity of small open areas distributed uniformly thereover positioned within said sleeve between

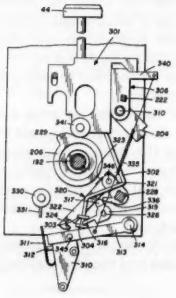


said light channeling means and said lens in a separate plane from at least said lens.

3,919,544
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex.; George William Childs, deceased, late of Dallas, Tex., by Patricia M. Childs, executrix, Dallas, Tex., assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,924
Int. Cl.² G07C *13/00*
U.S. Cl. 235—51 **3 Claims**



1. A voting machine having a plurality of aligned columns of voting keys arranged within a frame member, said keys being movable between a non-voted position and a voted position; and tally means movable between a non-registering position and a registering position for actuation by said keys to register a selection only if at least one of said keys is in the voted position, comprising:

vote registration means associated with said tally means and movable from a first position to a second position to actuate said tally means for movement to said registering position;

blocking means in abutting position engaging said vote registration means to block movement of said vote registration means to said second position, said blocking means being selectively movable to a non-abutting position disengaging said vote registration means;

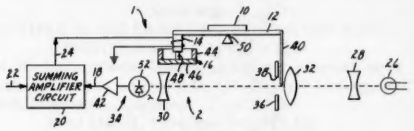
a plurality of bars each being linked to one of said keys and movable from a first position to a second position in response to movement of said one key from said non-voted to said voted position; and

a rotatable shaft connected between each of said bars and said blocking means and rotatable in response to movement of any of said bars to said second position to move said blocking means to said non-abutting position disengaging said vote registration means.

3,919,545
OBJECT POSITIONING APPARATUS

David J. Schoon, Marine on St. Croix, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1974, Ser. No. 466,975
Int. Cl.² G01J *1/20*
U.S. Cl. 250—201 **28 Claims**



1. Object positioning apparatus including:

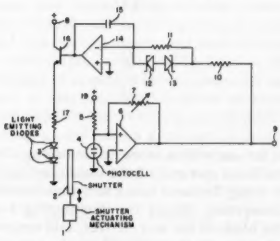
an electric to motion transducer means connected with the object, said transducer means positioned in response to an electrical positioning input signal and to a feedback signal directly related to the actual position of the object and

an optical sensing means responsive to the actual position of the object for providing said feedback signal, said optical sensing means including a light to electric transducer connected for applying said feedback signal to said electric to motion transducer, a light means for providing a uniform light flux distribution, a light shutter positioned with respect to said light means for receiving said uniform light flux distribution and operatively connected with the object for controlling the passage of light via said shutter in accordance with the position of said object and light control means positioned with respect to said light means and said light shutter for converging at said light to electric transducer the light flux presented at said light shutter.

3,919,546
APPARATUS FOR OBTAINING AN ELECTRICAL SIGNAL FROM MECHANICAL MOTION

Paul A. Lutus, Parkridge, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed May 29, 1974, Ser. No. 474,451
Int. Cl.² G01J *1/32;* **G01D** *5/36;* **H01J** *39/12*
U.S. Cl. 250—205 **4 Claims**



1. An apparatus for converting periodic movements of an object into an electrical signal comprising a source of radiation, a solar cell in the path of the radiation from said radiation source for converting the radiation into an electrical signal corresponding to the magnitude of the radiation impinging thereon, a shutter in the path of the radiation between said radiation source and said photo cell means and mechanically connected to said object for partially blocking the radiation from the radiation source from impinging on said solar cell in

response to the periodic motion of said object, whereby the solar cell provides an electrical output signal corresponding to the motion of the object, a source of bias current connected to said solar cell and having a constant magnitude equal to the instantaneous magnitude of the output current of the solar cell when the shutter is at the average position thereof, the direction of the currents from said bias source and said solar cell being opposite with respect to the point of connection between the bias source and the solar cell, both said solar cell and said radiation source means further providing undesirable gradual changes in output in response to ambient conditions and aging phenomena, and negative feedback means for integrating the output signal from said solar cell and for varying the radiation output level of said radiation source inversely as the integral of the electrical output signal from said solar cell.

3,919,547

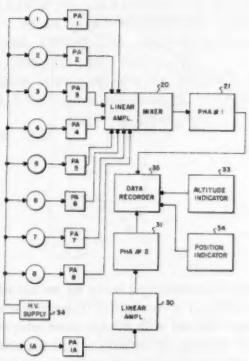
METHODS FOR LOCATING SUBTERANEAN PETROLEUM-BEARING DEPOSITS

Robert S. Foote, 742 Snowden, Richardson, Tex. 75080

Filed Nov. 1, 1973, Ser. No. 411,832

Int. Cl. G01t *1/20*

U.S. Cl. 250—253 **3 Claims**



1. The method of identifying the peripheral regions adjacent a subteranean petroleum-bearing deposit comprising the steps of

a. traversing a linear section of the surface of the earth,

b. measuring gamma radiation indicative of K^{40} and $T1^{208}$ at periodic intervals during said traverse, and

c. locating regions within said linear section wherein the ratio of gamma radiation indicative of $T1^{208}$ to gamma radiation indicative of K^{40} is high relative to surrounding regions.

3,919,548

X-RAY ENERGY SPECTROMETER SYSTEM

David E. Porter, P.O. Box 4093, Burlingame, Calif. 94010

Filed July 24, 1974, Ser. No. 491,300

Int. Cl.² G01N *23/20*; **G21K** *1/00*, *7/00*

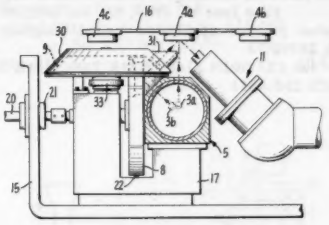
U.S. Cl. 250—277 **7 Claims**

1. In a spectrometer system for x-ray energy analysis of a sample, the improvement comprising

collimated detector means deployed to detect the quantity and characteristic wavelength of fluorescent x-rays emitted from said sample upon its excitation;

an x-ray spectroscopy tube emitting primary x-rays from an internal primary target;

a first turret means carrying an array of secondary targets of differing composition and indexible to expose one secondary target at a time to primary x-rays emitted from the primary target, and thereby to induce fluorescent x-ray emission from said one secondary target;



housing means shielding said sample from the primary x-rays and directing them only to said one secondary target; and

shield-collimator means directing said fluorescent x-rays to said sample.

3,919,549

PORTABLE X-RAY SPECTROMETER

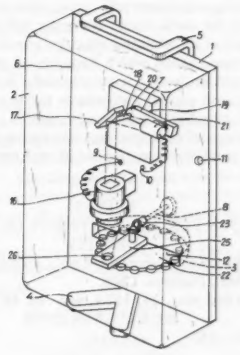
Jean Sahores, and Etienne Larribau, both of Pau, France, assignors to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Mar. 16, 1973, Ser. No. 342,279

Claims priority, application France, Mar. 17, 1972, 72.09419

Int. Cl. H01j *37/26*

U.S. Cl. 250—310 **7 Claims**



1. A portable X-ray spectrometer comprising:

a casing capable of supporting a partial vacuum of 10^{-1} to 10^{-3} torrs in a chamber defined therewithin,

a sample holder within said casing for supporting samples to be analyzed,

a cold cathode gas tube having a grid shaped anode and a low temperature cathode adapted to operate on a supply voltage as low as about 5kV, both spaced from said sample holder and positioned to project an electron beam against a sample supported by said sample holder in alignment with said cathode and anode,

an analyzing crystal positioned to receive X-ray radiation from said sample,

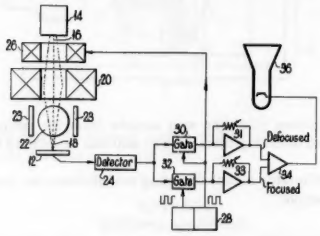
goniometric means positioned to receive X-ray radiation reflected from said crystal,

said goniometric means, analyzing crystal, sample holder and gas tube all lying in a unitary common atmosphere defined within said casing.

3,919,550
SCANNING ELECTRON MICROSCOPES

John Randolph Banbury, Hale, England, assignor to Associated Electrical Industries Limited, London, England

Filed June 17, 1974, Ser. No. 480,148
Claims priority, application United Kingdom, June 16, 1973, 28998/73
Int. Cl.² G01N 23/00; G21K 7/00; H01K 37/26
U.S. Cl. 250—311 19 Claims

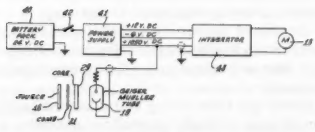


1. A scanning electron microscope including an electron source for producing an electron probe directed towards a specimen; means for scanning said probe in a predetermined pattern relative to the specimen; detector means for collecting radiation issuing from said specimen as a result of scanning by said probe to produce an output signal representing the instantaneous magnitude of said radiation; means for alternately focusing and defocusing said probe to illuminate alternately a relatively small region of the specimen and a relatively extended region of the specimen, thereby causing said output signal to alternate between a focused value, which depends on the nature of the small region currently being scanned by the probe as well as on the total electron current of said probe, and a defocused value, which depends on the total electron current of said probe but is substantially independent of the scanning of said probe; and means for processing together successive focused and defocused values of said output signal so as to substantially compensate said focused value for variations in the total electron current of said probe.

3,919,551
APPARATUS FOR MEASUREMENT OF TREE CORE DENSITY

Donald W. Blincow, Claremont, Calif., assignor to Tyco Laboratories, Inc., Pomona, Calif.

Filed Mar. 14, 1974, Ser. No. 451,157
Int. Cl.² G01N 23/06
U.S. Cl. 250—358 6 Claims



1. In an apparatus for measuring density of an elongate thin core of substantially uniform cross section area, the combination of:

a radiation source in the form of a rod providing a substantially uniform flux along the length thereof;

a radiation detector in the form of a tube providing a substantially uniform response along the length thereof;

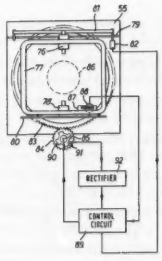
means for mounting said source and detector in parallel spaced relation and defining a core receiving space therebetween with said source and detector positioned so that the entire cross section of the core is in the radiation path from said source to said detector; and

an integrator unit having the output of said detector as an input and providing an output varying as a function of the average density of the entire cross section of a core positioned in said space.

3,919,552
METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 349,242, April 9, 1973, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,538, Aug. 21, 1969, abandoned. This application May 9, 1974, Ser. No. 468,522
Claims priority, application United Kingdom, Aug. 23, 1968, 40317/68
Int. Cl. G01t 1/00
U.S. Cl. 250—360 5 Claims



1. Apparatus for examining a body by means of penetrating radiation such as X- or γ- radiation including a scanning and locating structure formed with an aperture adapted to receive said body, source means, mounted on said scanning and locating structure, adapted to produce at least one beam of radiation, detector means responsive to said beam of radiations mounted on said scanning and locating structure, the source means and the detector means being arranged to face each other across said aperture, means for causing the scanning and locating structure to move relative to the body so that the source means and the detector means orbit around the body in a plane which defines a plane of interest in the body, means for causing said beam to effect a reciprocable lateral scanning movement in said plane relative to said structure, so as to scan said aperture, said scanning and locating structure including attenuator means positioned between said source means and said detector means and extending laterally in said plane to the extent of said aperture, said attenuator means being arranged to orbit with said source means and detector means.

3,919,553
INTEGRATED DEVICE FOR CONTROLLING CHARGING ARTIFACTS IN SCANNING ELECTRON MICROSCOPES

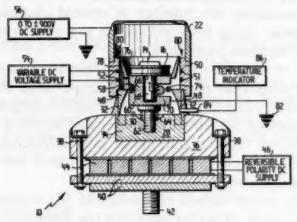
Arthur L. Cohen, Pullman, Wash.; Gerald E. Garner, Santa Monica, Calif., and Raymond G. E. Steever, Jr., Pullman, Wash., assignors to Research Corporation, New York, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,555
Int. Cl.² G01N 23/00
U.S. Cl. 250—311 20 Claims

1. A method for controlling electron beam specimen charging in an electron microscope comprising the steps of:

introducing a charge-neutralizing vapor into said electron microscope,

directing said vapor into a region within said microscope at which said specimen is normally positioned; and,

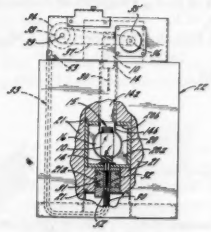


neutralizing charges accumulated on said specimen due to impingement of said electron beam on said sample by contacting said sample with said vapor.

3,919,554
ELEVATOR MECHANISM AND METHOD FOR SCINTILLATION DETECTORS

Edmund Frank, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Continuation-in-part of Ser. No. 241,987, April 7, 1972, abandoned. This application June 11, 1973, Ser. No. 368,693
Int. Cl. G01t *7/08*
U.S. Cl. 250—328 **10 Claims**

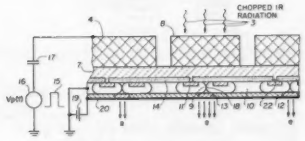


1. An elevator mechanism for raising and lowering radioactive samples through a shielded vertical counting chamber in a scintillation detector, said elevator mechanism comprising the combination of platform means mounted for vertical movement through said counting chamber and its top shielding, an elongated flexible member secured at one end to the bottom of said platform means and extending downwardly through said counting chamber and its bottom shielding, laterally away from said chamber below the bottom thereof, and then upwardly with said flexible member terminating with its other end at an elevation above said chamber, a reel rotatably disposed above the shielding of said chamber, said other member end being secured to said reel, said member being unsupported along the length of travel of said platform means and sufficiently rigid to support said platform means throughout said length of travel, said member also being sufficiently flexible to be bent around the shielding below said counting chamber, and reversible drive means coupled to said reel for winding and unwinding said member onto and off of said reel to shift said member through said counting chamber and thereby raising and lowering said platform means through said counting chamber and its top shielding.

3,919,555
DIRECT VIEW INFRA-RED TO VISIBLE LIGHT CONVERTER

Barry M. Singer, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,450
Int. Cl.[2] H01J *31/50*
U.S. Cl. 250—332 **10 Claims**



1. A direct view infra-red to visible light converter comprising an evacuated envelope having therein a semi-conductor photocathode, a layer of pyroelectric material over and thermally insulated from said semi-conductor photocathode, means responsive to electrons positioned to respond to electrons emitted by said semi-conductor photocathode to create a visible image, means to apply a potential to said pyroelectric layer which is reduced by incident infra-red radiation, and means to apply a potential to said semi-conductor photocathode at which a current flow is produced therein when said potential applied to said pyroelectric layer is reduced by the incident infra-red radiation, said semi-conductor photocathode comprising at least one field effect transistor having source and drain regions spaced apart by a channel region and having a gate region separated by a barrier from the channel region and capable when pulsed of establishing a depletion region in the channel, an electron-emissive element comprising a p-type semi-conductor and an injecting junction located not substantially more than a diffusion length for electrons from a free surface of said P-type semi-conductor, said p-type semi-conductor, injecting junction and one of the transistor source and drain regions being electrically connected in series, said transistor structure being mounted such that infra-red radiation incident on the pyroelectric layer which reduces the potential across the pyroelectric layer changes the potential on said gate thereby allowing current to conduct from the source to the drain.

3,919,556
GAMMA CAMERA

Walter H. Berninger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1974, Ser. No. 470,048
Int. Cl. G01t *1/20*
U.S. Cl. 250—366 **31 Claims**

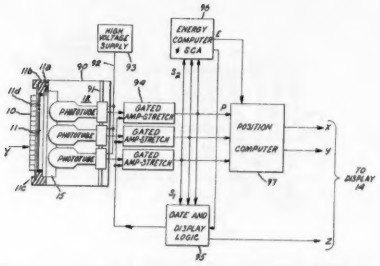
1. In an improved radiation detector responding to incident nuclear particles or rays of electromagnetic radiation and producing electrical signals corresponding to the coordinate of position of each incident event linearly therewith and substantially independent of spacing between light pulse producing means and photoelectric tube components of the detector, the combination comprising

means for collimating incident nuclear particles or rays of electromagnetic radiation emitted from an external source,

means having an input end at an output end of said collimating means for producing a pulse of light in response to an absorbed incident nuclear particle or ray of electromagnetic radiation, the number of optical photons in each

light pulse being proportional to the energy of the absorbed incident particle or ray,

an array of photoelectric tubes having geometrically corrected nonplanar photocathodes disposed in close proximity to an output end of said light pulse producing means for detecting the optical photons and emitting electrons in response thereto, outputs of said photoelectric tubes producing electrical signals in response to the detected optical photons, and



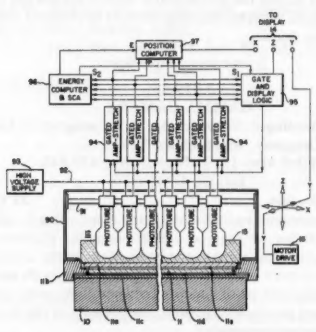
electronic circuit means connected to the outputs of said photoelectric tubes for resolving the photoelectric tubes output electrical signals into electrical signals representing the coordinates of position of each of the pulses of light produced in said light pulse producing means and substantially linearly therewith and substantially independent of spacing between said light pulse producing means and the photocathodes of said plurality of said photoelectric tubes as a direct result of the geometrically corrected nonplanar photocathodes so as to permit the close spacing of the photocathodes to said light pulse producing means.

3,919,557

WHOLE BODY LINE SCANNER

Walter H. Berninger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1974, Ser. No. 470,047
Int. Cl. G01t 1/20
U.S. Cl. 250—366 **34 Claims**



1. In an improved scanning radiation detector responding to incident nuclear particles or rays of electromagnetic radiation and producing electrical signals corresponding to the coordinate of position of each incident event linearly therewith and substantially independent of spacing between the light pulse producing means and photoelectric tube components of the detector, the combination comprising

means for collimating incident nuclear particles or rays of electromagnetic radiation emitted from an external source,

means having an input end at an output end of said collimating means for producing a pulse of light in response to an absorbed incident nuclear particle or ray of electromagnetic radiation, the number of optical photons in each light pulse being proportional to the energy of the absorbed incident particle or ray,

an array of photoelectric tubes having geometrically corrected nonplanar photocathodes disposed in close proximity to an output end of said light pulse producing means for detecting the optical photons and emitting electrons in response thereto, outputs of said photoelectric tubes producing electrical signals in response to the detected optical photons,

electronic circuit means connected to the outputs of said photoelectric tubes for resolving the photoelectric tubes output electrical signals into electrical signals representing the x-axis coordinate of position of each of the pulses of light produced in said light pulse producing means and substantially linearly therewith and substantially independent of spacing between said light pulse producing means and the photocathodes of said plurality of said photoelectric tubes as a direct result of the geometrically corrected nonplanar photocathodes so as to permit the close spacing of the photocathodes to said light pulse producing means, and

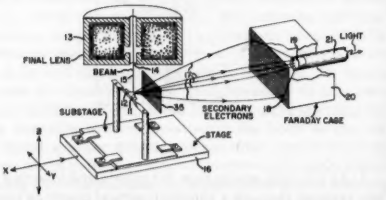
means for scanning the external source of nuclear particles or rays of electromagnetic radiation in the y-axis direction.

3,919,558

HOT SUB-STAGE FOR A SCANNING ELECTRON MICROSCOPE

Joseph W. Brouillette, Jamesville, and William E. Leyshon, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,609
Int. Cl.² H01J 37/20
U.S. Cl. 250—443 **3 Claims**



1. A hot sub-stage for supporting and heating a sample in a scanning electron microscope wherein an electron beam impinges on a sample and secondary electrons emitted from the beam impact area are collected for image formation, the collection means having a field for accelerating electrons from said impact region, said hot-stage comprising:

a boat for supporting and heating said sample in a position allowing secondary electrons emitted from said impact area to pursue both rectilinear and curved propagation paths to said collection means, said boat being formed of a flexible, reflective, refractory, conductive foil, deformable to enclose said sample in a heat confining manner while avoiding interference with said beam or said propagation paths, said foil having current conducting cross-sections selected for electrically heating said sample,

terminal means arranged to provide two point electrical contact for heating and mechanically supporting said boat, and

a conductive grid in close proximity to said boat, embracing said propagation paths and oriented in a plane perpendic-

ular thereto, said grid having a potential in respect to said boat which is selected to prevent thermionically emitted electrons from penetrating said grid and entering said collection field while permitting secondary electrons to enter said collection field.

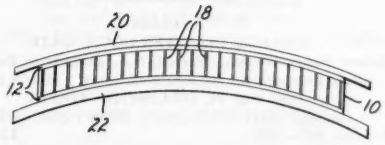
3,919,559
LOUVERED FILM FOR UNIDIRECTIONAL LIGHT FROM A POINT SOURCE

Edward J. Stevens, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 284,403, Aug. 28, 1972, which is a continuation-in-part of Ser. No. 128,280, March 26, 1971, abandoned. This application July 12, 1974, Ser. No. 487,990

Int. Cl.² G21F *5/04*

U.S. Cl. 250—508 **10 Claims**



1. In a process for the production of thermoplastic sheet material having diverging louver elements, the steps of

1. thermally bonding at least one thin sheet of metal to a flat sheet of radiation-transparent thermoplastic material having substantially parallel radiation-opaque louver elements at a uniform angle to its surface to form a hot laminate,
2. arcuately deforming said hot laminate forming an arcuate laminate having substantially parallel louver elements and cooling said laminates, and
3. separating each said sheet of metal from said arcuate laminate after cooling to provide an arcuate radiation-controlling sheet having substantially parallel louver elements.

3,919,560
METHOD AND APPARATUS FOR LOCATING A CONTINUOUSLY MOVING WEB

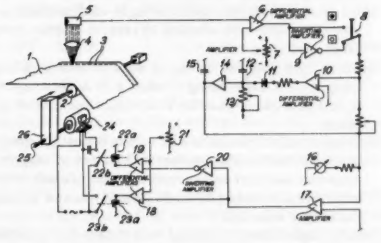
Peter Nopper, Lyss, Switzerland, assignor to Zumbach Electronic-Automatic, Orpund, Switzerland

Filed Apr. 5, 1974, Ser. No. 458,420

Claims priority, application Switzerland, Apr. 19, 1973, 5733/73

Int. Cl.² G01N *21/26*

U.S. Cl. 250—557 **17 Claims**



16. An apparatus for guiding a continuous web, comprising a servo-control mechanism for adjusting the lateral position of the web, a photoelectric scanning means adapted to provide at an output thereof an output signal indicative of the lateral position relatively thereto of spaced index marks on said web, a switch means having an input connected to the output of said scanning means and an output connected to an imput of a storage means providing a control signal to said servo-control mechanism, means for measuring the longitudinal movement of said web, and means, controlled by said measuring means, for momentarily closing said switch means at predetermined increments of movement of said web.

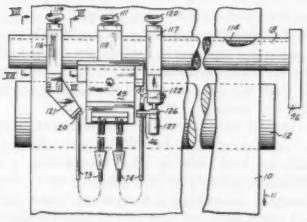
3,919,561
REGISTER CONTROL SCANNER ASSEMBLY AND METHOD

Daniel A. Coberley, Danville, Ill., assignor to Hurletron Altair, Danville, Ill.

Filed May 28, 1974, Ser. No. 473,873

Int. Cl.² G02B *5/16;* **G01N** *21/30*

U.S. Cl. 250—561 **8 Claims**



1. In a register control scanner assembly for sensing passage of marks on a web wherein light is transmitted to the path of the marks, and reflected light from the marks is sensed by electric circuitry to produce electric scanner pulses for use in controlling register,

a light conduit element having individual optical fibers randomly distributed between an incoming light bundle and an outgoing light bundle at an end of the element remote from the path of the marks, said optical fibers at the opposite end of the conduit element adjacent the path of the marks providing a cross-sectional configuration arranged to essentially match the geometry of a linear mark,

mounting means for retaining the end of the element remote from the path of the marks stationary relative to said mounting means during a mark scanning operation,

said light conduit element being of bendable and twistable construction so as to be bendably and twistably adustable relative to said end thereof remote from the path of the marks so as to accommodate marks of different location and angular orientation while said end thereof remote from the path of the marks remains stationary, and

auxiliary rigidifying means carried by said mounting means and connected with said opposite end of the conduit element adjacent the path of the marks and being laterally and angularly adjustable and being operable for stably retaining said opposite end in scanning relation to the path of the mark during a mark scanning operation while accommodating lateral and angular adjustment of such opposite end so as to correspond to different lateral positions and angular orientations of the marks on the web.

3,919,562

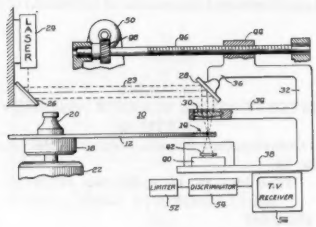
SLIT DETECTOR FOR OPTICAL DETECTOR SYSTEM

Robert L. Whitman, Oak Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 20, 1974, Ser. No. 471,396

Int. Cl.² G06K 7/10

U.S. Cl. 250—570 **6 Claims**



1. An optical system for detecting a time-varying signal spatially recorded upon a storage medium to form a light diffraction grating in the shape of an elongated track, said optical detection system comprising:

means for supporting said storage medium;

means for producing a beam of light;

means for focusing said beam to produce a reading spot for illuminating said track, said reading spot having a dimension in the longitudinal direction of said track which is less than the wavelength of the highest spatial frequency recorded upon said storage medium;

drive means for displacing said medium, relative to said spot, at a predetermined velocity to effect a scan of said track by said reading spot to develop a time-varying diffraction pattern of said spot,

said pattern comprising at least a zero order, a +1 order and a −1 order with each of said orders having a distribution parallel to the longitudinal direction of said track,

an aperture positioned in the far field of said diffraction pattern near the boundary of said zero order for transmitting at least a portion of said zero order diffraction pattern,

said aperture comprising an opening having a dimension parallelling the longitudinal direction of said track which is less than one-half the distance across which said zero order is distributed; and

light responsive means positioned adjacent said aperture for deriving, in response to illumination thereof by that portion of said time varying pattern transmitted by said aperture, an electrical signal representative of said time varying signal spatially recorded upon said medium.

3,919,563

CONTROLLABLY SELF-RELEASABLE SAFETY FASTENER AND METHOD OF UNLOCKING SAME

Dominique Jean Lautier, Jouy en Josas; Lucien Louis Maeder, and Pierre Edmond Mayer, both of Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

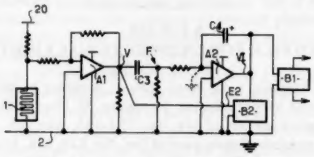
Filed Apr. 8, 1974, Ser. No. 458,590

Claims priority, application France, Apr. 10, 1973, 73.12931

Int. Cl.² A63C 9/00

U.S. Cl. 307—119 **27 Claims**

1. An automatically operable safety fastener operated under control of extraneous influences, comprising means for sensing and transducing into an electrical signal at least one force applied to at least one element of the fastener, first comparison means for comparing the electrical signal so derived with a predetermined minimal value, means connected to said first comparison means for integrating with respect to time said transduced signal to provide an integrated signal output only when the magnitude of the transduced signal is larger than said predetermined minimal value, second comparison means



for comparing said integrated signal with a predetermined maximum value, and fastener unlocking means actuated only when the magnitude of said integrated signal is greater than the magnitude of said predetermined maximum value.

3,919,564

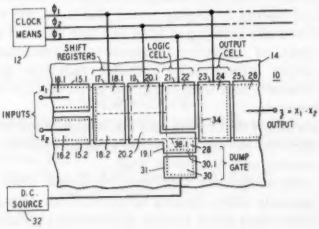
CHARGE TRANSFER LOGIC GATE

Robert Henry Walden, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1974, Ser. No. 470,546

Int. Cl.² H01L 27/10, 29/78; H03K 19/08, 19/22

U.S. Cl. 307—218 **12 Claims**



1. A charge transfer device for performing logic functions whenever m of a possible n input signals are applied to said device, where $2 \leq m \leq n$, said device comprising:

a charge storage medium,

first electrode means for forming in said medium a plurality n of one-bit shift registers, each of said shift registers comprising first and second subcells, each of said m input signals being coupled to a separate one of said first subcells, and in each shift register the second subcell being adapted to receive charge transferred from the first subcell,

second electrode means for forming in said medium a charge storage logic cell adapted to receive charge transferred from each of said second subcells,

third electrode means for forming in said medium a charge storage output cell adapted to receive charge transferred from said logic cell,

each of said subcells being of area A and said logic and output cells each being of area $k \times A$ ($k < 1$), as measured in a plane parallel to a major surface of said medium,

first asymmetric potential well means for establishing in said medium first surface potential barriers of magnitude V_B between said first and second subcells of each of said shift registers and between each of said second subcells and said logic cell, and

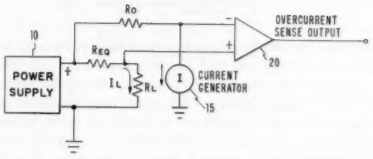
second asymmetric potential well means for establishing in said medium and between said logic and output cells a second surface potential barrier of magnitude V_T sufficiently greater than V_B so that, when each of said first and second subcells and said logic and output cells are con-

nected to suitable phases of a voltage clock, charge is caused to propagate in a direction from said first subcells to said output cell, said logic and output cells being connected to different phases of said clock, with said logic cell being connected to a timewise later phase, and the amplitude of the clock voltage in relation to V_B and V_T being effective to permit virtually complete transfer of charge across said barriers of magnitude V_B and to permit only partial transfer of charge across said barrier of magnitude V_T so that charge is transferred from said logic cell to said output cell only if m input signals are applied to said device.

3,919,565
OVERCURRENT SENSE CIRCUIT

Virgil R. Clark, Stewartville; Carroll D. Goodew, Rose Creek; Terrance W. Kueper, Rochester, and Byron H. Price, Byron, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,638
Int. Cl.² H03K *5/20;* **H02H** *7/20*
U.S. Cl. 307—235 R **7 Claims**



1. An overcurrent sense circuit for sensing an overcurrent in a load connected across a power supply subject to voltage variations comprising:

means connected between said power supply and load for generating a voltage drop proportional to current flowing through said load,

means including a constant current generator connected across said power supply for generating an offset voltage equal to a predetermined maximum voltage independent of voltage variations occurring in said power supply, and comparator means connected to receive said voltage drop and said offset voltage and generate one output level when said voltage drop is less than said offset voltage and another output level when said voltage drop exceeds said offset voltage.

3,919,566
SENSE-WRITE CIRCUIT FOR BIPOLAR INTEGRATED CIRCUIT RAM

Michael S. Millhollan, Mesa, and Ronald L. Treadway, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

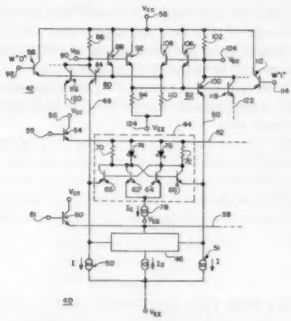
Filed Dec. 26, 1973, Ser. No. 428,153
Int. Cl.² H03K *5/20;* **G11C** *11/34*
U.S. Cl. 307—235 R **6 Claims**

1. A sense-write circuit for sensing voltage levels representative, respectively, of a logical 1 and a logical 0 stored in a digital storage circuit coupleable to first and second sense-write conductors and for writing voltage levels representative, respectively, of a logical 1 and a logical 0 into said storage circuit by means of said first and second sense-write conductors, respectively, comprising:

first amplifier circuit means coupled to said first sense-write conductor for interacting with said digital storage circuit to form a first unity-gain amplifier, said first amplifier circuit means having input circuit means and output circuit means thereof;

second amplifier circuit means coupled to said second sense-write conductor for interacting with said digital storage circuit to form a second unity-gain amplifier, said second amplifier circuit means having input circuit means and output circuit means thereof;

first driver circuit means having an input node coupled to said output circuit means of said first amplifier circuit means;



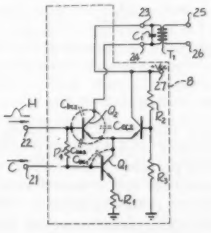
second driver circuit means having an input node coupled to said output circuit means of said second amplifier circuit means; and

said first driver circuit means having an output node coupled to said input means of said second amplifier circuit means and said second driver circuit means having an output node coupled to said input means of said first amplifier circuit means.

3,919,567
SIGNAL GATE CIRCUIT

Takashi Okada, Yamato, and Kimitake Utsunomiya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 21, 1973, Ser. No. 399,304
Claims priority, application Japan, Sept. 22, 1972, 47-110350
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H03K *17/00*
U.S. Cl. 307—254 **5 Claims**



1. A gate circuit comprising:

A. an information signal input terminal;

B. a gate signal input terminal;

C. a differential circuit comprising first, second and third semiconductor devices, each having first, second and third electrodes;

D. first and second power-supply terminals;

E. first circuit means connecting the first electrode of said first semiconductor device to said information signal input terminal;

F. second circuit means connecting the second electrode of said first semiconductor device to said second power supply terminal;

G. third circuit means connecting the first electrode of one of said second and third semiconductor devices to said gate signal input terminal;

H. biasing means connected to the first electrode of the other of said second and third semiconductor devices to bias the same to a normally conductive state;

I. fourth circuit means connecting the second electrodes of said second and third semiconductor devices to the third electrode of said first semiconductor device;

J. an output terminal connected to the third electrode of said second semiconductor device;

K. fifth circuit means connecting the third electrode of said third semiconductor device to said first power supply terminal; and

L. sixth circuit means connecting said gate signal input terminal to said first semiconductor device, whereby both said first and second semiconductor devices are made conductive during at least a portion of said gate signal and are made non-conductive between successive gate signals.

3,919,568

CIRCUIT FOR THE PREFERENTIAL STARTING OF A STAGE OF AN ELECTRONIC SEQUENCE HAVING A HOLDING CIRCUIT

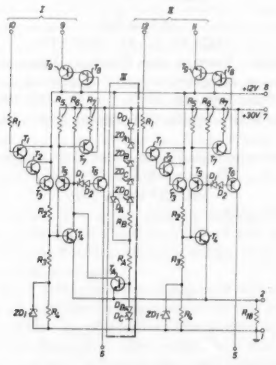
Willy Minner, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Main, Germany

Filed July 30, 1973, Ser. No. 383,560

Claims priority, application Germany, Aug. 1, 1972, 2237764

Int. Cl.² H03K *1/00*

U.S. Cl. 307—296 **13 Claims**



1. A circuit for the preferential starting of a stage of an electronic sequence circuit having a holding circuit, for the drive of which are provided a first supply voltage source producing a first potential and a second supply voltage source producing a second potential lower in value than the first potential, in which the voltage necessary for starting the preferred stage drops across a first component which is connected between the control electrode of a switching transistor setting the stage in operation and the potential connection common to the circuit, the switching transistor having two further electrodes defining a path whose impedance is controlled by the potential at its control electrode, the two further electrodes of the switching transistor being connected to the stage which is to be preferentially started in a manner such that a selected voltage at the control electrode switches the path whose impedance is controlled into a conductive state that sets the stage into operation, in which the first component is connected in series with resistances forming a voltage divider and at least one constant voltage element connected to the first supply voltage source, in which the tap of the voltage divider is connected, by means of a second component which is permeable to current in only one direction, to the second supply voltage source, whereby the current load which would be imposed on the first source by the constant voltage element in the absence of the second potential is at least substantially reduced by the application of the second potential to the divider.

3,919,569

DYNAMIC TWO DEVICE MEMORY CELL WHICH PROVIDES D.C. SENSE SIGNALS

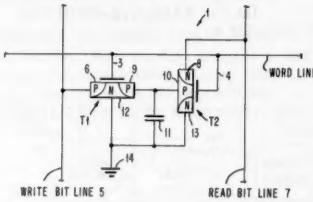
Fritz H. Gaensslen, Yorktown Heights, and Paul J. Krick, Crugers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

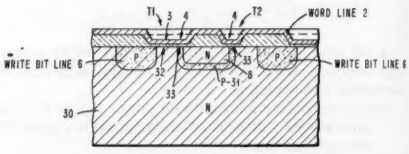
Filed Dec. 29, 1972, Ser. No. 319,402

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H03K *3/26, 19/08*

U.S. Cl. 307—304 **7 Claims**





1. A semiconductor memory cell comprising:

a first substrate of a first field effect transistor of one semiconductor conductivity type,

a second substrate of a second field effect transistor of second semiconductor conductivity type formed in said first substrate,

a region of said second conductivity type disposed in said first substrate,

a region of said one conductivity type disposed in said second substrate, and

means electrically connected to said region of second conductivity type, and said first and second substrates for applying at least first and second potentials to said second substrate to adjust the threshold of said second FET to at least two different values.

3,919,570

PIEZOELECTRIC FLASH-BULB IGNITION DEVICE

Horst Hörster, Roetgen; Walter Alfred Pusschert, Aachen; Heinz Schweppe, Aachen-Eilendorf, and Wolfram Czarnojan, Aachen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,845

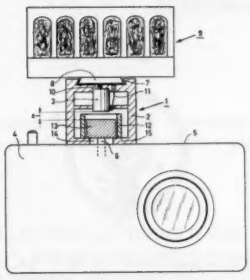
Claims priority, application Germany, Mar. 24, 1973, 2314820

Int. Cl.² H01L *41/04;* **G03B** *15/04*

U.S. Cl. 310—8.7 **5 Claims**

1. A device for igniting at least one electrically ignitable flash-bulb, said device including means for attaching said flash-bulb thereto and means for mounting said device to a photographic camera having a shutter and a pin extending

from one wall of the camera the associated pin being displaced axially upon actuation of the shutter from a first position to a second position, comprising means for producing an electric potential responsive to axial movement of said pin when said device is mounted on said camera, said means including a piezo-electric element having electric leads connected to the associated flash-bulb when a flash-bulb is attached to said device, a member, means for guiding said member for unrestricted movement toward and away from said element along



a path in aligned relationship to the axis of the pin, said member being disposed intermediate said piezo-electric element and said pin when said device is mounted on said camera, said member being disposed in spaced relation to said piezo-electric element when the pin is in the first position, said member impacting said piezo-electric element responsive to the movement of said pin to the second position, said member being disposed in spaced relation to the pin when in contact with said piezo-electric element.

3,919,571

BEARING FOR THE ROTOR OF A DYNAMO-ELECTRIC MACHINE PROVIDED WITH A SUPERCONDUCTING WINDING

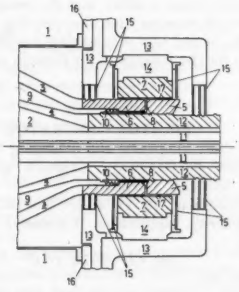
John S. H. Ross, Northumberland, England, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 29, 1973, Ser. No. 419,932

Claims priority, application Switzerland, Dec. 7, 1972, 17755/72

Int. Cl.² H02K *9/00*

U.S. Cl. 310—40 **5 Claims**



1. A bearing structure for supporting the rotor of an electrical machine, said rotor being composed of two concentric parts, the outermost one of said parts being in a region of normal temperature and the other part being in a region of low temperature and provided with a superconducting winding, said concentric rotor parts being rigidly joined together at one end of the rotor, whereas at the opposite end of the rotor the concentric rotor parts terminate in independent concentric shaft portions each of which is provided with its own bearing journal located in a bearing box common to both journals at the other end of the rotor thereby permitting relative axial movement of the concentric rotor parts resulting from thermal expansion.

3,919,572

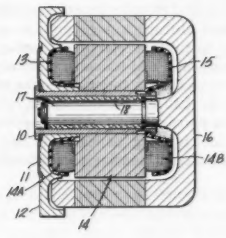
ELECTRICAL MOTOR CONSTRUCTION

Jacques J. Desy, Bearsville, N.Y., assignor to Rotron, Incorporated, Woodstock, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,081

Int. Cl.² H02K *15/12*

U.S. Cl. 310—45 **11 Claims**



1. An electrical motor having a rotor element and a stator element, at least one of said elements comprising:

a central arbor with a flange at one end and an annular detent groove at the other end;

a leaf spring mounted on said arbor and located against the flange;

a motor mounting structure located on said arbor next to said leaf spring, said mounting structure having an annular recess concentric with the axis of said central arbor; an insulating means for the annular recess of said mounting structure, said insulating means having a smooth predetermined shape;

a motor element winding assembly located on said central arbor with one of its winding end turns in contact with said insulating means; and

an insulating annular end cap mounted on said central arbor, the inner edge of said end cap having at least one tab which mates with the annular detent groove in said central arbor and holds the parts of the motor element together, the surface of said end cap facing the other of the winding end turns of said motor element having a smooth predetermined shape, thereby allowing the smooth surfaces of said insulating means and said end cap to hold the winding end turns of said motor element in a predetermined shape when the tab of the end cap is engaged in the annular detent groove of the central arbor.

3,919,573

ELECTRICAL CONTACT ARRANGEMENT FOR DISENGAGEABLE PARTS OF AN ELECTRIC TOOL

Peter Schmuck, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Liechtenstein

Continuation-in-part of Ser. No. 298,411, Oct. 17, 1972, abandoned. This application June 26, 1974, Ser. No. 483,294

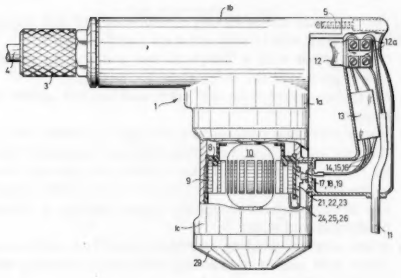
Claims priority, application Germany, Nov. 9, 1971, 2155686

Int. Cl.² H02K *7/14*

U.S. Cl. 310—50 **4 Claims**

1. An electric tool for use in a drilling or chiselling operation including a tool housing, a handle detachably connected to said tool housing, said tool housing comprising a first housing part having a tool holder at one end arranged to receive the tool and extending in the axial direction of said tool

holder, and a second housing part connected to said first housing part at its end opposite said holder and extending transversely of and laterally outwardly from said first housing part, said handle extending transversely of the axial direction of said tool holder and connected to the opposite end of said first housing part from said tool holder and to said second housing part, electrical means for operating the electric tool comprising first electrical parts located in said second housing part and second electrical parts located in said handle and said first electrical parts and second electrical parts being connectible for operating the electric tool, wherein the improvement comprises that said first electrical parts and second electrical parts each comprises contact elements arranged to interfit with one another with said contacts comprising knife blade-shaped contacts secured to one of said first and second electrical parts and stirrup-shaped contacts secured to the other one of said first and second electrical parts, said knifeblade shaped contacts and said stirrup-shaped contacts are displaceably interengageable to provide electrical contact between said first electrical parts and said second electrical parts, displaceable means for mechanically interconnecting said tool housing and said handle so that said handle can be removed with said second electrical parts and said contacts secured thereto as a unit from said tool housing, at least one first guide element provided on said second housing part laterally adjacent said



contacts therein and at least one second guide element provided on said handle laterally adjacent said contacts therein and said first and second guide elements being arranged to interengage when said tool housing and handle are assembled together for guiding said knife-blade shaped and stirrup-shaped contacts into interengagement and said contacts being arranged to disengage from one another automatically when said handle is removed from said tool housing, said second housing part including a removable cover, said first electrical parts within said second housing part comprising a stator including a casing with said stator and casing removably mounted as a unit in said second housing part, said contacts secured within said second housing part being connected to said casing of said stator, said stator said casing and said contacts connected thereto being removable from said second housing part as a unit in a direction transversely of the plugging direction of said handle into said second housing part, and said knife-blade shaped contacts arranged with the knife edges thereof located in planes extending substantially parallel to the direction of the removal of said stator said casing and said contacts from said second housing part and parallel to the plugging direction of said handle in said second housing part so that upon removal of said stator casing said contacts on said stator casing are automatically disconnected from said contacts secured within said handle.

3,919,574

MOTOR COMMUTATOR DUST SHIELD MEMBER FOR USE IN AN ELECTRICALLY OPERATED DRILLING DEVICE

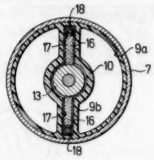
Peter Schmuck, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed May 20, 1974, Ser. No. 471,541

Claims priority, application Germany, May 30, 1973, 2327782

Int. Cl.² H02K 5/10

U.S. Cl. 310—68 **5 Claims**



1. In an electrically operated drilling device, such as used in rock drilling or chiseling operations, comprising a housing, a commutator motor positioned within said housing, said commutator motor including a commutator, carbon brushes positioned around said commutator in angularly spaced relation to one another, a carbon holder located within said housing and arranged to mount said carbon brushes in juxtaposition to said commutator, a motor shaft extending from said motor, a fan blade mounted on said motor shaft for rotation therewith, inlet openings located in one part of said housing, outlet openings located in said housing spaced from said inlet openings so that air can be drawn into said housing by said fan blade through said inlet openings circulated over said commutator motor and exhausted through said outlet openings for cooling said commutator motor, wherein the improvement comprises a shield positioned within said housing and disposed about said commutator to protect it from contact by foreign particles contained in the cooling air circulating through said housing, said shield and said carbon holder joined together as a unitary member, the unitary structure of said shield and carbon holder comprises a first ring-shaped member located within and extending around the inner surface of said housing, a second ring-shaped member in coaxial relationship with said first ring-shaped member spaced radially inwardly from said first ring-shaped member, connecting webs extending between said first and second ring-shaped member and completely enclosing said carbon brushes, and the inner surface of said first ring-shaped member and the opposing surfaces of said connecting webs and said second ring-shaped member defining openings for the passage of air through said housing.

3,919,575

VIBRATOR GENERATOR

Johannes Weber, Magstadt, and Wolfgang Schneider, Leinfelden, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 19, 1974, Ser. No. 507,622

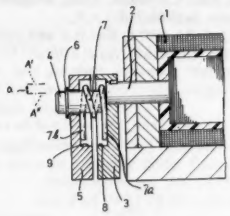
Claims priority, application Germany, Oct. 3, 1973, 7335748[U]

Int. Cl.² H02K 7/10

U.S. Cl. 310—81 **7 Claims**

1. A vibration generator, particularly for use with vibratory conveyors and vibratory screens, comprising a power unit having rotary output shaft; a pair of members constituting respective imbalanced masses, one of said members being fixedly mounted on said shaft for rotation therewith and the other of said members being turnable relative to said one member in response to rotation of said shaft; a crank pin having an axis which extends parallel but is eccentric relative to the axis of said output shaft, said other member being

turnably mounted on said crank pin; and means connected with said members and resiliently yieldably resisting the turning of said other member relative to said one member, said



means comprising a torsion spring surrounding said crank pin and having a pair of arms each of which engages one of said members.

3,919,576

ELECTRIC D-C VEHICLE MOTOR

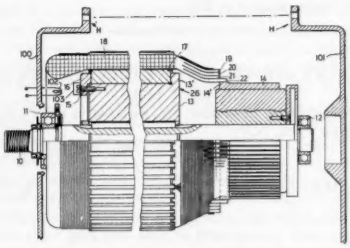
Hans Reinbeck, Stuttgart; Karl-Hubert Stracke, Meerbusch, and Alfred Collmer, Ludwigsburg, all of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Feb. 11, 1974, Ser. No. 440,986

Claims priority, application Germany, Mar. 2, 1973, 2310380

Int. Cl.[2] H02K *23/26*

U.S. Cl. 310—207 **9 Claims**



1. Light-weight electric d-c vehicle motor comprising a separately excited salient field pole stator and a rotor with slots in the magnetic circuit thereof a wave-type armature winding in the rotor slots, a commutator and light-weight structural support elements (**100, 101**) including end bells (100, **101**), wherein

the motor is a six-pole motor;

the winding is an exactly symmetrical armature stepped wave winding; one side of the armature winding coil is located in a slot adjacent the other side of another coil of the winding to provide for said exactly symmetrical armature winding;

the field pole has a non-uniform contour facing the air gap over its arcuate length, and is wider at the terminal ends of the field pole than at the center of the field pole, thus causing voltages between the commutator segments to be of a substantially uniform voltage potential over the circumference of the commutator;

the armature winding includes at least three stacked, superimposed individual flat conductor strips electrically and mechanically joined together and the bottom strip thereof is secured to a connection flag of the commutator element.

3,919,577

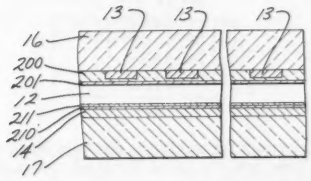
MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING THIN FILM DIELECTRIC CHARGE STORAGE MEMBER

Harold J. Hoehn, Toledo, and Roger E. Ernsthausen, Luckey, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 399,548, Sept. 21, 1973, Pat. No. 3,852,607, which is a continuation-in-part of Ser. No. 146,796, May 25, 1971, abandoned. This application Oct. 29, 1974, Ser. No. 518,421

Int. Cl.[2] H01J *61/30, 65/04*

U.S. Cl. 313—201 **1 Claim**



1. In a gaseous discharge display/memory device comprising an ionizable gaseous medium in a sealed gas chamber formed by a pair of opposed charge storage members backed by electrode members, the improvement wherein at least one charge storage member, consisting of at least two thin continuous dielectric layers, has a minimum thickness sufficient to store charges without deteriorating upon gas discharge and a maximum thickness less than that thickness at which the charge storage member becomes discontinuous due to breakdown caused by deposition originated stresses, said charge storage member comprising a first layer of about **10,000** angstrom units to about **125,000** angstrom units of aluminum oxide and a second layer of about **100** angstrom units to about **2000** angstrom units of a member selected from the group consisting of lead oxide and magnesium oxide.

3,919,578

TUNGSTEN-HALOGEN CYCLE ELECTRIC INCANDESCENT LAMP AND METHOD OF MANUFACTURING

James Richard Coaton, and John Michael Rees, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Oct. 16, 1973, Ser. No. 406,946

Claims priority, application United Kingdom, Oct. 18, 1972, 48064/72

Int. Cl.[2] H01K *1/50;* **H01J** *9/38, 9/395*

U.S. Cl. 313—222 **8 Claims**

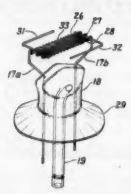
1. A method of making a tungstenhalogen cycle electric incandescent lamp comprising the steps of:

providing a light-transmitting high-temperature resisting envelope having an aperture therein, a tungsten filament therewithin, and lead-in wires connected to said filament and sealed therethrough; introducing P_2I_4 into said envelope through said aperture; exhausting said envelope; gas filling said envelope with a non-reactive gas; sealing said aperture; and raising said envelope to a high temperature sufficient to dissociate said P_2I_4, the introduction of said P_2I_4 being in a manner such as to produce said P_2I_4 in solid form prior to the raising of said envelope to said high temperature.

3,919,579
MULTIPLE-FILAMENT ELECTRODES FOR ELECTRIC DISCHARGE LAMPS

Eugene Lemmers, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 345,535, March 28, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,899
Int. Cl.² H01J 1/16
U.S. Cl. 313—273 5 Claims

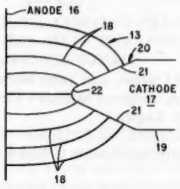


1. An electrode for an electric discharge lamp, comprising at least three helically coiled elongated electrical filaments arranged side by side in a row lying in a plane, the mutually adjacent ones of said filaments being positioned in close parallel mutual adjacency, the spacing between mutually adjacent filaments being no greater than the diameter of either of them, electron-emitting material coated on said filaments, and a pair of lead-in electrical conductors respectively at the ends of the plurality of filaments and connecting them in electrical parallel.

3,919,580
RELATIVISTIC ELECTRON BEAM GENERATOR

Leonard J. Mooney, Livermore, and Hugh M. Hyatt, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 11, 1974, Ser. No. 504,933
Int. Cl.² H01J 1/30
U.S. Cl. 313—310 7 Claims

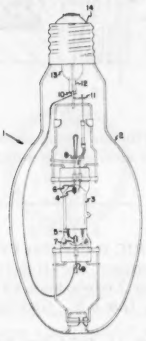


1. In an electron beam generator for gas laser excitation, the improvement comprising: a diode type relativistic electron beam source composed of a thin, flat anode and a convex contoured cathode, said convex contoured cathode having a body portion defining a rectangular cross-section, and a convex contoured end portion of a cross-section no greater than that of said body portion shaped such as to provide a substantially rectangular output beam with uniform current density, said cathode body portion having a rectangular cross-section in the range from 0.5-by-10 cm to 2-by-50 cm, said convex contoured end portion of said cathode defining a smooth substantially parabolic surface composed of a pair of converging tapered surfaces and a curved crown interconnecting said tapered surfaces, said tapered surfaces defining an angle of about 20° to 40° with respect to a longitudinal axis of said cathode, and said curved crown having a radius of ⅛ inch to ½ inch, said contoured cathode being positioned with respect to said anode so as to produce a rectangularly shaped electron beam orthogonal to the plane of said anode.

3,919,581
THORIA-YTTRIA EMISSION MIXTURE FOR DISCHARGE LAMPS

Ranajit K. Datta, East Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed July 12, 1974, Ser. No. 488,109
Int. Cl.² H01J 1/14, 19/06
U.S. Cl. 313—345 7 Claims

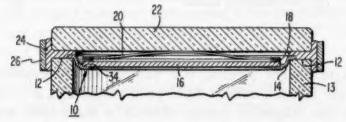


1. An electrode for an arc discharge device comprising a refractory metal substrate and an electron emissive material carried thereon comprising a solid solution of Y_2O_3 in ThO_2 wherein the proportion of Y_2O_3 is in the range from a small amount effective to improve emission characteristics up to about 50 mole percent in ThO_2.

3,919,582
TARGET MOUNTING STRUCTURE FOR USE IN CAMERA TUBE

Stefan Albert Ochs, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,395
Int. Cl.² H01J 29/02, 31/08
U.S. Cl. 313—383 13 Claims



1. A camera tube target support structure comprising:
a. a bulb having an end portion with a central opening;
b. a faceplate extending across said end portion and hermetically sealed thereto by means of a ring of conductive sealant material which is interposed between the end portion of said bulb and said faceplate;
c. a support ring having at least one flange at its outer periphery which is fixably seated against the end portion of said bulb by said ring of conductive sealant material, and a radially inwardly extending central portion with a substantially centralized aperture therein; said central portion including a substantially flat ledge surface displaced from and substantially parallel to a major facing surface of said faceplate; said inwardly extending central portion including a sloped centering portion protruding within the central opening of the end portion of said bulb;
d. a target seated against said ledge surface and extending across said centralized aperture in said support ring; and
e. means interposed between said faceplate and said

support ring for retaining said target firmly seated against said ledge surface of said support ring.

3,919,583

ELECTRON GUN WITH GRID AND ANODE HAVING ORTHOGONAL ELONGATED APERTURES

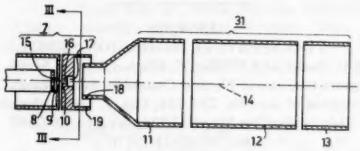
Jan Hasker, and Jacobus Johannes Maria Joseph De Klerr, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 166,935, July 28, 1971, abandoned. This application July 20, 1973, Ser. No. 381,074

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H01J *29/46, 29/56*

U.S. Cl. 313—448 **1 Claim**



1. A cathode-ray tube comprising an electron gun having, axially aligned, a cathode having substantially rotational symmetry, a grid, an anode and an acceleration electrode for producing an electron beam, said cathode-ray tube further comprising an electron focusing lens and a target plate comprising stripes of electro-luminescent material oriented in a first direction, said grid having a narrow, elongated opening that extends in said first direction and forms an astigmatic lens for producing an electron beam wherein electron paths lying in an imaginary plane extending in said first direction are focused at a point located at a given distance from said target plate on the side of said electron gun and electron paths lying in an imaginary plane at right angles to said first direction are focused substantially on the target plate, said anode comprising an elongated opening that has a major axis extending at substantially right angles to said first direction and that has a minimum width dimension exceeding the width of said grid opening, said anode opening intersecting the first anode face facing said grid so as to form a first aperture and intersecting the second anode face removed from said grid so as to form a second aperture, said second aperture being wider than said first aperture so that said anode opening widens in step-wise manner from said first face to said second face, said anode opening being substantially rectangular at said second anode face.

3,919,584

CATHODE RAY TUBE SCREEN HAVING BOTH SHORT AND LONG PERSISTENCE PHOSPHORS

Jean-Pierre Galves, and Pierre Merloz, both of Paris, France, assignors to Thomson-CSF, Paris, France

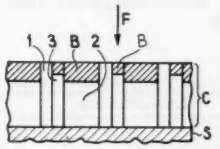
Filed Mar. 21, 1974, Ser. No. 453,336

Claims priority, application France, Mar. 27, 1973, 73.10944

Int. Cl.² H01J *29/26, 29/30*

U.S. Cl. 313—473 **3 Claims**

1. A cathode-ray tube with an electron gun; a screen whose luminescent coating comprises two kinds of phosphors; one having no persistence, on which an electron beam, at the location of its impact, produces a light trace of given spectrum which disappears virtually as soon as said impact appears; and the other having a certain persistence, upon which said trace, having a spectrum differing from that of the preceding one, remains visible for a certain time after said impact, and being equipped with an inert barrier producing no light trace under the effect of such an impact; said screen producing a persistent trace if a voltage accelerating the electrons of the beam is higher than the value necessary for said excite to cross said barrier and exicte luminescence in the persistent phosphor, and a non-persistent trace in respect of any voltage lower than said value, characterized in that said coating further comprises a third non-persistent kind of phosphor equipped with a barrier, the latter being such that said third phosphor is also excited when the voltage exceeds said value, its spectrum, superimposed upon that of the other non-persistent phosphor, yielding a colour substantially the same as that of the persistent phosphors, so that the light trace appearing on the screen at the location of impact of the beam, when the voltage exceeds said value and due to the two non-persistent kinds of phosphors, accordingly presents a colour substantially the same as that due to the persistent phosphor thus avoiding the flash effect, that is to say the appearance of a flash of a different colour preceding the appearance of the persistent trace of the screen.



3,919,585

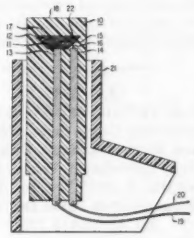
ENCAPSULATION FOR LIGHT EMITTING ELEMENT PROVIDING HIGH ON-OFF CONTRAST

Anthony Joseph Schorr, Birdsboro, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1974, Ser. No. 473,071

Int. Cl.² H05B *33/02*

U.S. Cl. 313—499 **1 Claim**



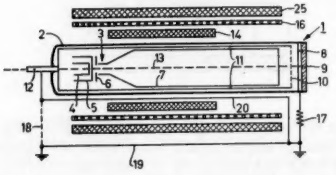
1. A light emitting device having high ON-OFF contrast for use in a well-lighted ambient, said device comprising

1. a light source comprising a semiconductor light emitting diode,
2. a first portion of transparent moldable epoxy material surrounding and immediately adjacent said light source, said first portion containing a dispersion of light dispersive particles,
3. a second portion of transparent moldable epoxy material surrounding said first portion in which light attenuation of internally generated light varies linearly with absorption but in which the attenuation of externally generated light reflected therein varies as the square of the absorption thereof, said second portion containing a neutral density light attenuating agent comprising a darkening agent in a percentage by weight of less than one percent.

3,919,586
GAUZE SUPPLY CONDUCTOR IN COIL UNIT FOR A TELEVISION CAMERA TUBE

Benedictus Timotheus Johannes Holman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 254,627, May 18, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 461,872
Claims priority, application Netherlands, May 22, 1971, 7107038
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01J *31/28, 31/38*
U.S. Cl. 315—8 **10 Claims**

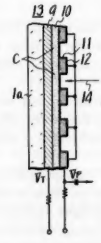


1. A device comprising a tube having a target, a mesh electrode disposed near said target, an interior mesh electrode conductor within said tube and coupled to said mesh electrode, and a signal output impedance element having a first end coupled to said target and a second end, a magnetic focusing coil disposed about said tube, an electromagnetic deflection coil means for generating a line deflection field, said deflection coil being disposed about said tube, said line deflection field having a neutral plane, a helical wire coil of soft magnetic material disposed between said focusing and deflection coils, an external mesh electrode supply conductor disposed in said neutral plane between said tube and said wire coil and having a first end means for coupling said external conductor to said interior conductor and a second end means for connecting said external conductor to said output impedance element second end; whereby said impedance element and said interior and external conductors form a loop that does not enclose said wire coil, thereby minimizing interference voltages between said target and mesh electrode.

3,919,587
ELECTRONIC STORAGE TUBE

Hiroki Sato, Yokohama; Toseki Saito, Matsudo; Koji Hirano, Yokohama, and Hiroh Takahashi, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,859
Claims priority, application Japan, Dec. 8, 1972, 47-123190
Int. Cl.² H01J *29/41*
U.S. Cl. 315—12 **15 Claims**

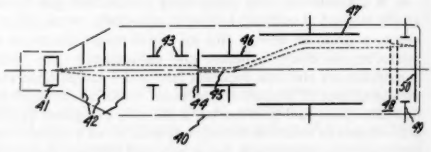


1. A storage tube comprising:
A. a target comprising:
1. a first conductive layer,
2. an insulating layer thereon, and
3. a second conductive layer, said second conductive layer comprising a pattern of apertures through which said insulating layer is directly exposed; the insulating layer being thinner at regions corresponding to each of said apertures than at regions covered by solid portions of said second conductive layer;
B. an electron source to direct electrons at said second conductive layer and the exposed portions of said insulator layer; and
C. means to apply different potentials to said first and second conductive layers to establish, selectively, conditions for recording a charge pattern of electrons from said source on said insulating layer and for reading said pattern and for erasing said pattern.

3,919,588
TWO-APERTURE IMMERSION LENS

Harold G. Parks, and William C. Hughes, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 294,021, Oct. 2, 1972, abandoned. This application May 8, 1974, Ser. No. 467,998
Int. Cl.² H01J *29/70*
U.S. Cl. 315—14 **6 Claims**

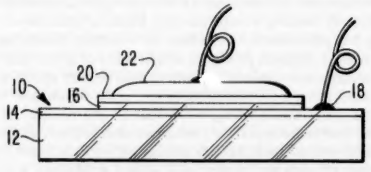


1. The method of improving the spherical aberration characteristics of an electron beam deflection system having coarse and fine deflection elements comprising the steps of:
positioning a pair of substantially parallel lens plates between said coarse and fine deflection elements along the optical axis of said electron beam, each of said plates having at least one aperture therein with said apertures aligned along the optical axis of said electron beam to permit at least a portion of the electron beam to pass through said apertures;
spacing said plates apart by a distance S which varies with the diameters D of said apertures and is within the range of *S/D* ratios of greater than 0 and less than 4; and
applying unequal bias voltages to said lens plates to produce an asymmetrical effect on the velocity of the electrons passing through said apertures.

3,919,589
ELECTROLUMINESCENT CELL WITH A CURRENT-LIMITING LAYER OF HIGH RESISTIVITY

Joseph John Hanak, Mercer, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 348,623, April 6, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,879
Int. Cl.² H05B *33/02*
U.S. Cl. 315—71 **14 Claims**



1. An electroluminescent cell comprising:

a. a substantially transparent first electrode,
b. a layer of an electroluminescent material on said first electrode,
c. a resistive film of cermet on said layer having a per cent conductor volume of from about 2% to about 20% such that said film exhibits a non-linear current-voltage characteristic and said conductor includes particles having an average size of from about 10A to about 20A, and
d. a second electrode attached to said film.

3,919,590

ARRANGEMENT FOR IGNITING A GAS AND/OR VAPOUR DISCHARGE LAMP PROVIDED WITH PREHEATABLE ELECTRODES

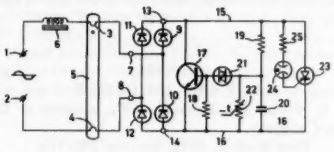
Michel Remery, and Andre Souvay, both of Evreux, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,069

Claims priority, application France, Mar. 30, 1973, 73.11530

Int. Cl. H05b *41/18*

U.S. Cl. 315—101 **13 Claims**



1. An ignition circuit for a discharge lamp provided with preheatable electrodes comprising, two input terminals adapted to be connected to an alternating voltage supply source, a stabilizing ballast inductor, means connecting the series arrangement of the stabilizing ballast inductor and the lamp across said input terminals, a starter circuit for the discharge lamp comprising, a transistor, means connecting the transistor to the ends of the lamp preheatable electrodes remote from the input terminals, means connecting the base of the transistor to a control circuit having means for switching the transistor alternately conducting and non-conducting at a frequency substantially higher than the frequency of the AC voltage source during the ignition procedure of the lamp, a further electrical switching element connected in a branch circuit arranged in parallel with the transistor and provided with an operating member by means of which said switching element is triggered into a conducting condition thereby suppressing the switching operation of the transistor during the ignition procedure at a time no later than during the first half of each half cycle of said AC supply voltage, said further switching element remaining conductive for the remainder of each half cycle during the ignition procedure.

3,919,591

GAS PANEL WITH IMPROVED WRITE-ERASE AND SUSTAIN CIRCUITS AND OPERATIONS

Tony N. Criscimagna, Woodstock, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,252

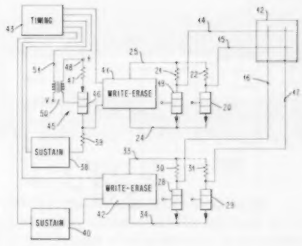
Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **12 Claims**

1. In a gas panel of the type having light emitting cells formed at crossover points of horizontal and vertical sets of conductors and in which avalanche ionization occurs in a light emitting cell at predetermined conditions of amplitude and width of a voltage pulse applied across the conductors of a cell, and having means for producing alternating polarity sustain pulses between said sets of conductors, a circuit for an improved voltage waveform for write operations on an addressed cell comprising,

means for producing a first relatively wide voltage pulse having an amplitude and width that are sufficient in combination by algebraic addition with a sustain voltage level waveform to produce a predetermined increased ionization level in an addressed cell that is less than avalanche ionization,

means for producing a second relatively narrow pulse having an amplitude that is sufficient in combination by algebraic addition with said first pulse and said sustain



voltage level waveform to produce avalanche ionization but-having a width insufficient to produce avalanche ionization in the absense of said first pulse,

means for applying said first and second pulses to said addressed cell with said sustain level pulse and means for timing said second pulse to occur at a predetermined point during the occurrence of said first pulse.

3,919,592

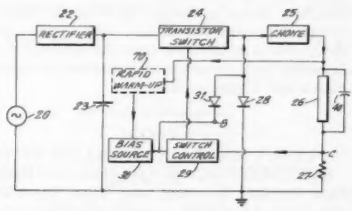
HIGH INTENSITY DISCHARGE MERCURY VAPOR LAMP DIMMING SYSTEM

George W. Gray, West Palm Beach, Fla., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Nov. 19, 1973, Ser. No. 416,869

Int. Cl.² H05B *37/02*

U.S. Cl. 315—199 **17 Claims**



6. An energizing circuit for operating and dimming a high intensity discharge lamp load, comprising in combination:

a high intensity discharge lamp;

a source of DC power;

lamp current regulator means connected between said lamp and said source of DC power for controlling the current applied to said lamp;

input control circuit means for controlling said lamp current regulator means;

dimmer control means connected to said input control circuit means for effecting dimming of the light output of said lamp;

and a capacitor connected in parallel with said lamp; said capacitor having a capacitance value; said capacitance value being less than a given value, and being sufficiently small, whereby the operation of said dimmer control means dims the output of said lamp to about 5 percent of its full intensity.

3,919,593

FLASH SAFETY DEVICE IN A FLASH APPARATUS

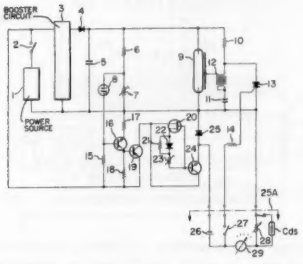
Zenzo Nakamura, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1973, Ser. No. 390,711

Claims priority, application Japan, Aug. 28, 1972, 47-100203[U]

Int. Cl. H05b *41/14*

U.S. Cl. 315—241 P **6 Claims**



1. A flash apparatus comprising:
an electric power supply means,
a main capacitor coupled with said supply means to be charged thereby,
a flash tube coupled to said main capacitor,
a trigger circuit coupled to said flash tube and capable of igniting said flash tube when the trigger circuit is enabled and a synchronizing signal applied to the circuit, said circuit including a capacitor for accumulating triggering energy, said capacitor being supplied with triggering energy, said trigger circuit including means for applying the energy to the flash tube when the circuit is enabled and the synchronizing signal applied,
a voltage detecting means coupled to said main capacitor for detecting the voltage across said main capacitor so as to emit an output therefrom corresponding to the voltage across said main capacitor,
a switching means connected between the output of said voltage detecting means and said trigger circuit and switchable to an ON state when the output of said voltage detecting means reaches a predetermined value so as to enable said trigger circuit.

3,919,594

COMPUTER FLASH APPARATUS WITH SERIES-CONNECTED CONTROL SWITCHES

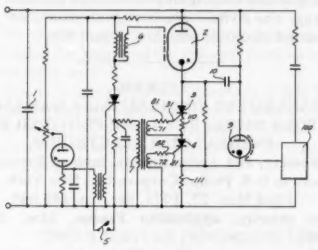
Gotthard Mahlich, Kronberg, and Heinz Engelstätter, Bad Soden, both of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Taunus, Germany

Filed June 18, 1974, Ser. No. 480,501

Int. Cl.² H05B *39/00*

U.S. Cl. 315—241 P **4 Claims**

1. In electronic flash apparatus having storage means for storing the energy required for said flash, said storage means having storage output terminals furnishing a predetermined voltage when said storage means is charged, in combination, a series circuit connected across said output terminals, said series circuit comprising flash generating means for furnishing said flash in response to an ignition signal, and a first and second switch each having a main conducting circuit connected in series with said flash generating means and having, respectively, a first and second control electrode, each of said main conducting circuits switching from a non-conductive to a conductive state in response to a control signal at the respective control electrode; ignition circuit means coupled to said flash generating means for furnishing said ignition signal upon external activation; first and second connecting means for connecting said ignition circuit to said first and second control electrodes in such a manner that said control electrodes receive said control signals substantially simultaneously with the furnishing of said ignition signal to said flash generating means thereby switching said main conducting circuits to the conducting state; and terminating circuit means connected to said main conducting circuits, for blocking the current flow therethrough thereby terminating said flash at the end of the exposure time.



3,919,595

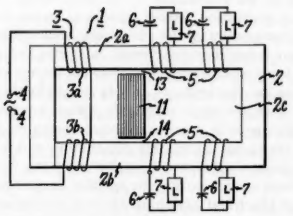
LAMP BALLAST DEVICE

Candler A. Willis, Jr., Zirconia, N.C., assignor to General Electric Company

Filed Sept. 1, 1972, Ser. No. 285,724

Int. Cl.² H05B *41/16*

U.S. Cl. 315—257 **13 Claims**



1. Electrical ballast apparatus for operating a plurality of gaseous discharge lamps comprising, in combination, a transformer having a magnetic core providing a closed magnetic circuit, primary winding means on a first portion of said core and secondary winding means on a second portion of said core, magnetic shunt means arranged on said core between said primary winding means and said secondary winding means, said secondary winding means comprising a plurality of secondary windings on one side of said magnetic shunt means, and a plurality of gaseous discharge lamps connected respectively to said plurality of secondary windings.

3,919,596

TOUCH SENSITIVE POWER CONTROL SYSTEM

Robert Elliott Bellis, 700 7th St., Boulder City, Nev. 89005

Filed Jan. 31, 1973, Ser. No. 328,371

Int. Cl.² H05B *37/02, 39/02*; G01D *21/04*

U.S. Cl. 315—294 **10 Claims**

1. A capacitance responsive power control system including, in combination:
a. a bidirectional triggerable switch having current input and output electrodes connectable to a load terminal, and a gate electrode for receiving control signals which control the conductivity of said switch,
b. a bistable flip-flop connected to said triggerable switch for controlling the on-off gate-current to said switch,

c. a trigger network connected to the input of said bistable flip-flop for coupling control signals thereto to switch the flip-flop between its two stable conductive states,

d. a touch signal input circuit coupled to a single electrical input touch control surface and responsive to body capacitance signals applied thereto for providing a variable output signal, and

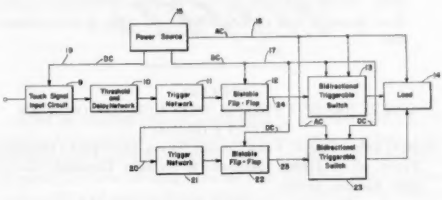
e. noise discrimination circuit means intercoupling the output of said touch signal input circuit to the input of said trigger network for providing a threshold voltage which must be exceeded by the output signal level from said touch signal input circuit, said noise discrimination circuit means further providing a predetermined time delay which discriminates against signal durations less than said time delay to thereby prevent the latter from overcoming said threshold level and altering the conductive state of said flip-flop.

10. A capacitance responsive power control system including, in combination:

a. a bidirectional triggerable switch having current input and output electrodes connectable to a load terminal, and a gate electrode for receiving control signals which control the conductivity of said switch,

b. a bistable flip-flop connected to said triggerable switch for controlling the on-off gate current to said switch,

c. a trigger network connected to the input of said bistable flip-flop for coupling control signals thereto to switch the flip-flop between its two stable conductive states,



d. a touch signal input circuit coupled to a single electrical input touch control surface and responsive to body capacitance signals applied thereto for providing a variable output signal, and

e. noise discrimination circuit means coupling the output of said touch signal input circuit to the input of said trigger network, said noise discrimination circuit means including:

i. a series resistor and a Zener diode serially connected between the output of said touch signal input circuit and said trigger network for providing a signal path to the input of said trigger network,

ii. a load resistor connected between the common node of said Zener diode and said trigger network and the power supply terminal, and

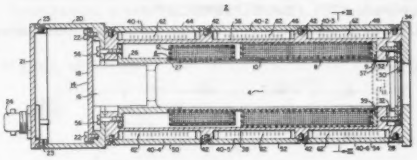
iii. a capacitor connected between a common node of said series resistor and said Zener diode and said power supply terminal, whereby the capacitor begins to charge up to a predetermined threshold level after said input touch control surface receives a body capacitance signal, and said Zener diode is biased to reverse conduction to conduct current to said input circuit after said capacitor has charged to a predetermined level, whereby a time delay is introduced into signals coupled from said touch signal input circuit to said trigger network; said time delay discriminating against signal durations less than said time delay to thereby prevent the latter signals from overcoming said threshold level and altering the conductive state of said flip-flop.

3,919,597

SUBMINIATURE TELEVISION CAMERA

James H. Meacham, Laurel, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 16, 1972, Ser. No. 253,745
Int. Cl.² H01J *29/58*
U.S. Cl. 315—382 **12 Claims**



1. A heat sink for an electron tube comprising:

a cylindrical assembly concentric with said tube for substantially the entire length of said tube and positioned in heat exchange relationship with said tube;

support means aligned axially with said cylindrical assembly and engaging and positioning said tube and said cylindrical assembly in fixed concentric relationship for securing said tube and said cylindrical assembly against vibration and wherein said support means further is positioned in heat exchange relationship with said cylindrical assembly and said tube for withdrawing heat from said cylindrical assembly and said tube; and

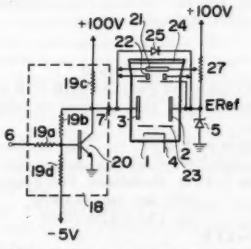
a socket assembly adapted to receive said tube and extending into said support means, said support means shielding said socket assembly from external electrostatic pickup.

3,919,598

DEFLECTION BLANKING CIRCUIT FOR USE IN A CATHODE RAY OSCILLOSCOPE

Hiroshi Samizo, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1973, Ser. No. 389,210
Claims priority, application Japan, Oct. 9, 1972, 47-101467
Int. Cl.² H01J *29/52*
U.S. Cl. 315—385 **11 Claims**



1. A deflection blanking circuit for a cathode ray tube having a cathode, horizontal plates and vertical plates comprising:

means for supplying reference D.C. bias voltage;

a first deflection blanking plate for deflecting an electron beam inpinging upon a screen of the tube and connected to the D.C. bias voltage source,

a second deflection blanking plate spaced apart and in parallel with said first deflection blanking plate;

means for amplifying an input voltage and applying a series of unblanking pulses from an output thereof to said second plate to said two deflection blanking plates; and,

a diode connected across said deflection blanking plates for clipping the output of said amplifier at the level of said reference voltage.

3,919,599
HORIZONTAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVERS

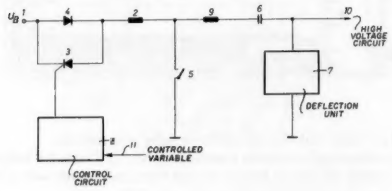
Klaus Reh, Albershausen, and Peter Schulz, Esslingen-Hegensberg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,519

Claims priority, application Germany, Oct. 6, 1972, 2253386

Int. Cl.² H01J *29/70*

U.S. Cl. 315—387 **6 Claims**



1. A horizontal deflection circuit for television receivers, comprising: means for controlling a horizontal sweep; means for controlling commutation;

a deflection unit controlled by the previously mentioned means;

a dc voltage source;

a storage inductance connected in series with the dc voltage source and the deflection unit, said commutation control means formed and arranged to connect the storage inductance across the dc voltage source during periods of commutation;

means connected in series with the storage inductance for permitting current to flow in a first direction from the source to the inductance while blocking reverse current flow; and

an electronic switch means connected in parallel with the last mentioned means for blocking current flow in the first direction to the inductance from the source and for allowing a current flow in the opposite direction during a period controlled in accordance with a controlled variable developed across the deflection unit during commutation and corresponding to the energy requirements of the horizontal deflection circuit.

3,919,600
OVERLOAD CURRENT PROTECTOR FOR A. C. MOTORS

James E. Sons, Sanger, Tex., assignor to Detprotector, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 342,398, March 19, 1973, Pat. No. 3,840,780, which is a continuation of Ser. No. 150,541, June 7, 1971, abandoned. This application Apr. 25, 1974, Ser. No. 463,976

Int. Cl.² H02H *7/085*

U.S. Cl. 317—13 R **5 Claims**

1. A system for protecting a multi-phase alternating current motor from current overload comprising:

a current transformer coupled to each of said phases of said motor,

means for connecting the output of each of said transformers to a summing point,

a differential amplifier connected to said summing point for detecting the occurrence of a current overload on any of said phases,

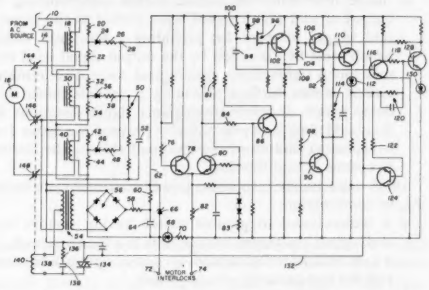
a digital circuit connected to said amplifier for generating a logic level in dependence upon the output of said amplifier,

a normally conductive field effect transistor coupled to said digital circuit for becoming nonconductive upon the occurrence of a current overload,

a capacitor connected to said field effect transistor,

a pair of normally nonconductive transistors coupled to said field effect transistor, one of said pair of transistors coupled to said capacitor in order to initiate a timing cycle before said field effect transistor may be again rendered conductive after the occurrence of a current overload,

a first light emitting device,



the other of said pair of transistors operable to energize said first light emitting device to indicate the occurrence of said timing cycle,

a triac,

switch means for normally maintaining said triac in conduction and operable in response to the occurrence of a current overload to render said traic nonconductive, and relay means operable by said triac to terminate current flow through said phases when said triac is nonconductive.

3,919,601
OVERCURRENT PROTECTION CIRCUIT [FOR AN OBJECT CIRCUIT]

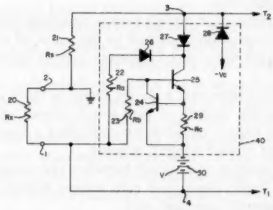
Shoichi Suko, Tokyo; Kozo Uchida, Fussa, and Selichi Tamada, Tama, all of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Oct. 25, 1973, Ser. No. 409,744

Claims priority, application Japan, Oct. 26, 1972, 47-106683; Aug. 9, 1973, 48-88795

Int. Cl.² H02H *3/20*

U.S. Cl. 317—31 **6 Claims**



1. An overcurrent protection circuit connected in series between a power source terminal and a load terminal, comprising:

a high-breakdown voltage transistor having a collector-emitter conductive path connected in series between the power source and the load,

a high voltage breakdown diode connected in series between the load and the collector of said transistor to prevent application of a high reverse voltage to said high-breakdown voltage transistor,

detection means comprising a detection resistor connected in series to the collector-emitter conductive path of said high-breakdown voltage transistor to detect a current

flowing through said high-breakdown voltage transistor and

control means comprising a control resistor having one terminal connected to the base of said transistor and having another terminal connected to a junction of the source and the load operatively coupled to said detection means for reducing the collector current of the transistor in response to the increase of said current detected by said detection means.

3,919,602

ELECTRIC CIRCUIT ARRANGEMENT AND METHOD OF MAKING THE SAME

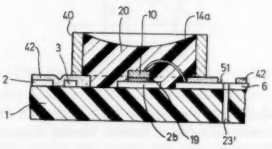
Anton Kaiser; Helmut Keller, both of Reutlingen, and Adolf Kugelmann, Leonberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 2, 1973, Ser. No. 337,742

Claims priority, application Germany, Mar. 23, 1972, 2214163; May 31, 1972, 2226395

Int. Cl.[2] H05K *5/60*

U.S. Cl. 317—101 C **24 Claims**



1. In an electric circuit arrangement, a combination comprising a circuit board of electrically insulating synthetic plastic material having two major surfaces and provided with a plurality of holes passing through said circuit board from one to the other of said surfaces; circuit means on said one surface of said circuit board and including a plurality of electrically conducting circuit strips of copper each having a thickness greater than 20 μ; anti-solder lacquer applied to selected regions of at least said one surface of said circuit board and of said circuit means; at least one semi-conductor unit having a surface provided with a plurality of terminals; means for connecting said semi-conductor unit with said circuit board at said one surface thereof so that said terminals are exposed; flexible conductor means for electrically connecting the respective ones of said terminals to the respective ones of said circuit strips and forming loops having apexes spaced at most a predetermined distance from said one surface of said circuit board; a hollow cylindrical element connected to said one surface of said circuit board so as to surround at least said semi-conductor unit and said conductor means and having a height exceeding said distance for protecting said semi-conductor unit and said conductor means from mechanical damage; protective potting means in said cylindrical element over said semi-conductor unit and said conductor means and including a body of polymerizable material having a height exceeding said distance but smaller than said height of said cylindrical element so that the latter bounds with said body a depression; at least one discrete electrical component provided with electrical input and output leads and arranged adjacent said other surface of said circuit board, said leads of said electrical component passing through said holes and having respective free ends at said one surface of said circuit board outside of said selected regions; and solder means applied to said one surface of said circuit board and operative for connecting said leads to the associated ones of said circuit strips, said anti-solder lacquer and an air cushion in said depression protecting said selected regions and said semi-conductor unit with said conductor means, respectively, from said solder means during the application thereof to said one surface of said circuit board.

3,919,603

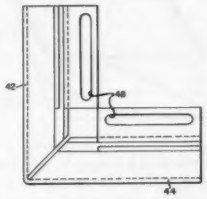
SWITCHBOARD FRAMEWORK CORNER TIE

John G. Salvati; Louis N. Ricci, both of Beaver Falls, and Thomas E. Clark, Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 334,329, Feb. 21, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,485

Int. Cl.[2] H02B *1/02*

U.S. Cl. 317—121 **5 Claims**



1. A metal-enclosed switchgear framework comprising:

a plurality of elongated structural support members, each of said support members having a longitudinally extending opening therethrough from one end to the other and a first pair of non-connected and spaced flanges disposed perpendicular to each other and extending away from the longitudinally extending opening,

a plurality of single piece corner ties, each of said corner ties comprising at least three leg portions extending outwardly from a common central portion; each of the leg portions fitting snugly inside and retained within the longitudinal openings extending through the associated structural support members and including a second pair of non-connected and spaced flanges disposed perpendicular to each other and extending outward from and outside of the longitudinally extending opening in the associated structural support member parallel to portions of said first pair of flanges;

fastening means connecting said first pair of flanges to said second pair of flanges;

said plurality of single piece corner ties supporting said structural support members and restricting movement of each of said structural support members to a single direction generally away from said corner tie along the longitudinal axis of said structural support member;

said plurality of structural support members being assembled with said plurality of corner ties and defining a polyhedron shaped framework with the end portions of each of said plurality of structural support members disposed around a portion of one of the legs of the associated corner ties; and

each of said structural support members fastened at the opposite ends to the leg portions of a pair of said plurality of corner ties.

3,919,604

ELECTROLYTIC CAPACITOR HAVING AN INTEGRATED SPACER SYSTEM

Robert S. Alwitt, and Sidney D. Ross, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 14, 1972, Ser. No. 280,395

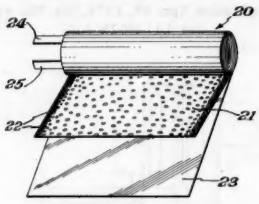
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H01G *9/02, 9/24*

U.S. Cl. 317—230 **4 Claims**

1. An electrolytic capacitor comprising a capacitance section of convolutely wound electrodes, said electrodes being a

formed anode foil electrode of a valve metal, and a cathode contact foil electrode having a substantially non-continuous spacer consisting essentially of inert thermoplastic particles sintered onto at least one major surface thereof separating said anode and said cathode foil electrodes, said spacer particles covering from 1-20% of the total cathode surface area and having a greater particle density along the edges of said cathode foil electrode than elsewhere thereon, and an electrolyte in contact with said electrodes through said spacer.



4. An electrolytic capacitor comprising: a capacitance section of convolutely wound electrodes, said electrodes being an aluminum foil anode electrode having an oxide film formed thereon, and a cathode contact foil electrode having a substantially non-continuous spacer consisting essentially of inert, non-conducting epoxy particles sintered onto both major surfaces thereof and separating said anode and said cathode, said spacer particles having a thickness in the range of 0.0005 to 0.005 inch and covering about 10% of the total cathode surface area with a greater particle density along the edges of said cathode foil electrode than elsewhere thereon; and an electrolyte in contact with said electrodes through said spacer.

3,919,605

CORONA DISCHARGE APPARATUS

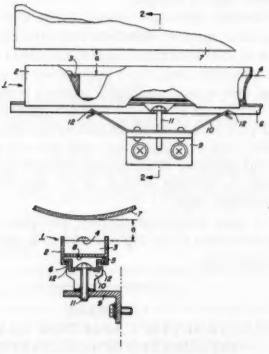
Ko Honda, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed May 13, 1974, Ser. No. 469,489

Claims priority, application Japan, May 18, 1973, 48-057832 [U]

Int. Cl.² G03G *15/02*; H01T *19/00*

U.S. Cl. 317—262 A **1 Claim**



1. The combination of a corona discharge device having an elongated shield and a corona wire mounted within and extending along the shield, with an improved apparatus for adjustably supporting the device adjacent to a photosensitive surface, the improvement comprising:

a supporting base, means forming a channel along the shield, a supporting rail confined within the channel for supporting the device on the base adjacent to the photosensitive surface, a plate spring disposed at each end of the rail, each plate spring being interposed between the base and the rail and adapted to bias the rail in a first direction, each of the plate springs having flange means thereon for confining the rail therebetween, and screw means for adjustably moving the rail to a desired position against the bias of each of the plate springs and retaining the rail in the desired position.

3,919,606

TRANSISTOR DRIVING CIRCUIT FOR MOVABLE ELEMENT

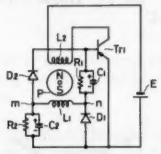
Koji Nemoto, Tama, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Mar. 5, 1974, Ser. No. 448,186

Claims priority, application Japan, Mar. 10, 1973, 48-27595

Int. Cl.² H02K *33/00*

U.S. Cl. 318—128 **8 Claims**



1. A transistor driving device for a movable element comprising: a driven movable element having magnetic poles of opposite polarity spaced thereon; a detecting coil for detecting the movement of said movable element with magnetic poles thereon and having a detection voltage induced therein in response to the detection of said movement; a driving coil electromagnetically coupled to said movable element for driving said movable element; a first charging circuit comprising both an amplitude limiter and an impedance comprising a capacitor charged by a half cycle of the detection voltage induced in said detecting coil; a second charging circuit comprising both another amplitude limiter and another impedance comprising another capacitor charged by said half cycle of said detection voltage; a first discharging circuit discharging a stored charge of the capacitor in said first charging circuit during a half cycle succeeding the first-mentioned half cycle; a second discharging circuit discharging a stored charge of the capacitor in said second charging circuit during the second half cycle of said detection voltage; a transistor circuit having an output connected to said driving coil and an input comprising said first charging and discharging circuits and said second charging and discharging circuits; a source of power connected to said driving coil and said input of said transistor circuit.

3,919,607

APPARATUS FOR DAMPING OSCILLATIONS IN A TRACK-BOUND PROPULSION VEHICLE HAVING A SYNCHRONOUS LINEAR MOTOR

Adolf Habock, Uttenreuth, Austria, and Joachim Holtz, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1974, Ser. No. 501,745

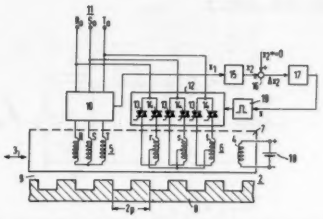
Claims priority, application Germany, Sept. 14, 1973, 2346457

Int. Cl.² H02P *7/00*

U.S. Cl. 318—135 **19 Claims**

1. In the trackbound propulsion vehicle driven by a synchronous linear motor having an excitation winding and a traveling field winding supplied from a fixed a-c system, means of generating a transversal field in the air gap for the synchronous linear motor comprising:

a. a transversal field winding;
b. control means to supply said transversal field winding with and variable current, in response to a input signal;
c. means to measure the power oscillations in said linear motor and to provide an output indicative thereof; and



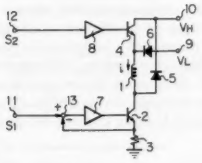
d. means having the output of said measuring means as an input and providing a control signal to said control means.

3,919,608

SYSTEM FOR DRIVING A PULSE MOTOR

Hiroshi Usami; Katsuo Kohari, both of Yokohama, and Hiroshi Ishida, Tokyo, all of Japan, assignors to Fujitsu Ltd. and Fujitsu Fanuc Limited, both of Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,331
Claims priority, application Japan, July 26, 1973, 48-83601
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **4 Claims**



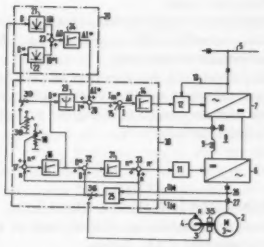
1. A method for driving an electric multiphase pulse motor which is provided with an exciting coil corresponding to each phase of said motor and said motor revolves in response to trapezoidal waveform exciting signals, comprising the steps of:
generating a trapezoidal waveform exciting signal for each phase, said waveform having an increasing staircase portion of increment steps and a decreasing staircase portion of increment steps;
applying the trapezoidal waveform exciting signal for each phase to the respective exciting coils via respective linear amplifiers to produce exciting current in said respective exciting coils; and
applying high voltage exciting pulses to said exciting coils during said increasing staircase portion of the respective waveforms, said high voltage exciting pulses being synchronized with the steps of said increasing staircase portion of said trapezoidal waveform exciting signals and having a desired pulse width for increasing the current corresponding to each increment step of said increasing staircase portion, thereby producing a trapezoidal waveform exciting current in each of said exciting coils.

3,919,609

METHOD AND CIRCUIT FOR REDUCING THE TORQUE RIPPLE OF A ROTATING-FIELD MACHINE

Herwig Klautschek, Furth, and Dieter Köllensperger, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 27, 1973, Ser. No. 374,002
Claims priority, application Germany, July 14, 1972, 2234681
Int. Cl. H02d *5/40*
U.S. Cl. 318—227 **9 Claims**



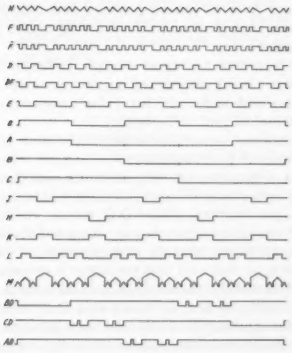
1. In a drive system for a rotating machine wherein the machine is coupled to a multiphase AC line through a first converter, a DC link and a second converter, said system having means for controlling the current flowing in the DC link, a method of reducing the torque ripple comprising:
a. measuring the actual value of torque developed by the machine;
b. establishing a predetermined reference value of torque which is to be maintained;
c. comparing the measured value of torque with said predetermined reference value to develop an error signal; and
d. providing said error signal as a correction term to the means for controlling current in the DC link.

3,919,610

AC MOTOR SPEED CONTROL

Jimmie D. Gillett, Garland, Tex., assignor to Unitron Incorporated, Garland, Tex.

Filed Nov. 13, 1974, Ser. No. 523,325
Int. Cl.² H02P *5/40*
U.S. Cl. 318—231 **10 Claims**



1. In a device for supplying drive voltages, having a fundamental frequency controlled by a speed determining signal, to a multi-phase motor:

means responsive to said speed determining signal for providing a time base signal having a first predetermined number of transitions for each cycle of said fundamental frequency, thereby providing a second predetermined number of time intervals within each of said cycles of said fundamental frequency;

means responsive to said time base signal for generating a composite waveform in which the amplitude of said composite waveform in a first of said second predetermined number of time intervals varies between a first value and a second value and in a second of said second predetermined number of time intervals between a third value and a fourth value; and

means responsive to said speed determining signal and said composite waveform for generating said drive voltage;

the improvement comprising:

means for controlling the duration of said first of said second predetermined number of time intervals to be different than said second of said second predetermined number of time intervals.

3,919,611

BRAKING DEVICE FOR A SMALL DC MOTOR

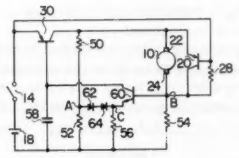
Tadashi Takahashi, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 7, 1973, Ser. No. 422,723

Claims priority, application Japan, Dec. 11, 1972, 47-123329

Int. Cl.² H02P 3/12

U.S. Cl. 318—380 **8 Claims**



1. A braking device for a D.C. motor comprising

a D.C. power supply for said D.C. motor;

switching means for controlling said D.C. power supply, said switching means enabling said D.C. power supply to supply power to said D.C. motor when said switching means is in its closed position and disabling said D.C. power supply when said switching means is in its open position;

a first transistor having an emitter, collector and base, said emitter being connected to one terminal of said D.C. motor and said collector being connected to the other terminal of said D.C. motor;

a first resistor connected between said base and said collector of said first transistor;

a second transistor having an emitter, collector and base, said collector of said second transistor being connected to said one terminal of said D.C. motor, and said emitter of said second transistor being connected to said base of said first transistor and to one terminal of said switching means, so that said first transistor is reverse biased when said switching means is in its said closed position and automatically acts to brake said D.C. motor when said switching means is in its said open position; and

speed detector means, responsive to the rotational speed of said D.C. motor, for supplying the base current of said second transistor in proportion to said rotational speed, whereby said power supplied to said D.C. motor is varied to keep said rotational speed constant when said switching means is in its said closed position.

3,919,612

INTERVAL WINDSHIELD WIPER ARRANGEMENT

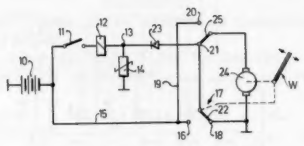
Rudiger Ratzel, Buhl, and Helmut Steinmann, Baden-Baden, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 22, 1974, Ser. No. 453,981

Claims priority, application Germany, May 18, 1973, 2325255

Int. Cl.² H02P 1/04

U.S. Cl. 318—DIG. 2 **6 Claims**



1. In an interval windshield wiper arrangement, in combination, a windshield wiper drive motor; a source of electrical energy; a relay comprised of a relay winding having one terminal connected to said source for energization thereby and to be maintained thereby at a first predetermined potential a second terminal and including an associated relay switch operative when said winding becomes energized for connecting said motor to said source to initiate motor operation; temperature-dependent blocking means connected to said second terminal and operative when above a predetermined temperature for preventing energization of said winding and operative when below a predetermined temperature for permitting energization of said winding; and wiper-position-dependent switch means including means operative when the wiper leaves a predetermined end position thereof for applying to said second terminal of said relay winding a potential such that the voltage drop across said relay winding will become sufficient to maintain said relay winding energized, and for establishing a heating current path for the flow of a heating current to heat up said blocking means, and operative when the wiper reaches said end position for interrupting said heating current path to initiate cooling of said blocking means, whereby after elapse of a sufficient cooling time interval the blocking means reassumes a temperature permitting renewed energization of said relay winding, said wiper position-dependent switch means comprising means operative when the wiper reaches said end position for establishing a braking current path for the flow of braking current out of said motor.

3,919,613

WIPER-WASHER CIRCUIT ARRANGEMENT

Helmut Steinmann, Baden-Baden, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 9, 1974, Ser. No. 513,516

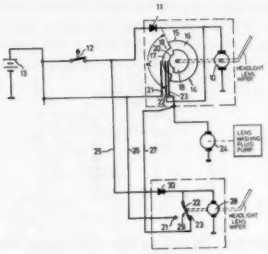
Claims priority, application Germany, Oct. 11, 1973, 2350959

Int. Cl.² H02P 3/14

U.S. Cl. 318—443 **7 Claims**

1. In a wiper-washer arrangement, particularly an arrangement for wiping and washing the front of a vehicle headlight, a vehicle windshield or the like, in combination, an electric wiper motor for driving a wiper, having first and second wiper motor terminals; a switch device comprising a switch contact electrically connected to said first wiper motor terminal, a work contact and a rest contact, and further including switching means mechanically coupled to and driven by said wiper motor and operative for causing said switch contact to alternately come into electrical engagement with said work contact and said rest contact; a source of electrical energy having first and second source terminals; means for connecting said first and second wiper motor terminals to said first and second source terminals, respectively, to establish a principal motor current path for the flow of wiper motor drive current, and

including means for interrupting said principal motor current path; an electric pump motor for driving a pump which discharges a washing fluid onto the surface to be washed, having first and second pump motor terminals; means connecting said first source terminal to said work contact for establishing an auxiliary current path for the flow of wiper motor drive current when said switch contact is in electrical engagement with



said work contact; and means connecting said first pump motor terminal to said rest contact and said second pump motor terminal to said second source terminal, for establishing a braking current path for the flow of wiper motor braking current through said pump motor when said switch contact is in electrical engagement with said rest contact and said principal motor current path is in interrupted condition.

3,919,614

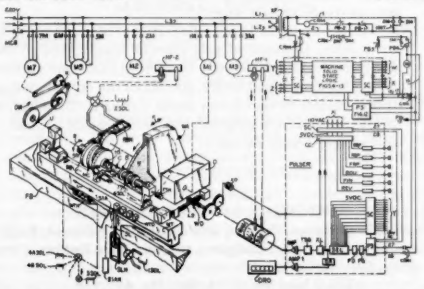
DUAL-CYCLE CAM GRINDING MACHINE WITH ELECTRICAL PULSE OPERATED WHEEL FEED

George E. Wespi, Holden, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Division of Ser. No. 218,359, Jan. 17, 1972, Pat. No. 3,797,176, which is a continuation-in-part of Ser. No. 60,288, Aug. 3, 1970, Pat. No. 3,701,220. This application Dec. 27, 1973, Ser. No. 428,708

Int. Cl.[2] G05B *11/18*

U.S. Cl. 318—571 **4 Claims**



1. Wheel feed control apparatus for a grinding machine having a rotatable grinding wheel for grinding the surface of a workpiece, said apparatus comprising

wheel advance means for moving said grinding wheel toward and away from the workpiece during rotation of the grinding wheel, said wheel advance means including support means for rotatably supporting said grinding wheel and motor means for effecting movement of said support means between a plurality of operating positions including a rough reset preset position in which said grinding wheel is spaced apart from a rough outer surface of the workpiece, a rough size preset position in which said grinding wheel is disposed in engagement with the outer surface of the workpiece when the workpiece has a preselected rough size, a finish reset preset position in which said grinding wheel is spaced apart from the outer surface of the workpiece when the workpiece has the preselected rough size, and finish size preset position in which said grinding wheel is disposed in engagement with the outer surface of the workpiece when the workpiece has a preselected finished size,

a step form output operator for said motor means constructed and arranged to respond to an electrical pulsating input signal,

first electrical pulse generator means for generating electrical pulses at any one of a plurality of pulse rates,

means for selecting desired one of said plurality of pulse rates,

selector means connected with said first pulse generator means and step operator to effect operation of said motor means as a function of a selected frequency and number of the applied pulses thereby producing a selected rate and number of incremental wheel advance movements,

to operate said wheel advance means on open loop control to effect movement of said support means between said rough reset preset position, rough size preset position, finish reset preset position and finish size preset position, logic control means for effecting operation of said motor means to automatically move said support means through a plurality of operating cycles which includes movement of said support means from the rough reset preset position to the rough size position at a speed corresponding to a first pulse rate to rough grind the workpiece and to effect subsequent movement of said support means from the finish preset reset position to the finish size preset position at a speed corresponding to a secnd pulse rate which is slower than said first pulse rate to finish grind the workpiece,

said logic control means including counter means for counting the pulses produced by said first electrical pulse generator and means for presetting said pulse counting means to count members of pulses corresponding to movement of said wheel support means to said rough reset preset position, said rough size preset position, said finish reset preset position and said finish size preset position,

manual control means for effecting manual operation of said logic control means to operate said motor means and move said wheel support means between selected ones of said plurality of positions.

said manual control means being operatively connected with said logic control means to effect operation of said motor means and movement of said wheel support means between selected ones of said plurality of positions in response to input signals transmitted from said manual control means to said logic control means, and

manual/automatic switching means for selectively setting said logic control means to selectively operate in manual and automatic modes.

3,919,615

POWER BELT

Ronald Niecke, 93 Ashburne Drive, Islington, Ontario, Canada

Filed Mar. 18, 1974, Ser. No. 452,169

Int. Cl.[2] H02J *7/00;* **A45F** *5/00*

U.S. Cl. 320—2 **12 Claims**

1. A power belt comprising:

a belt member adapted to be secured around a person's waist in use;

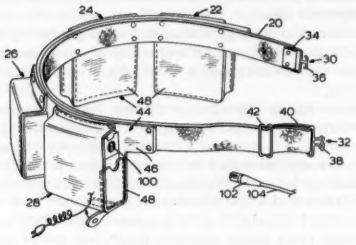
a plurality of pockets coupled to said member and spaced along it;

an inverter unit adapted to be received in one of said pockets, the remaining pockets being adapted to receive electrical cells;

a connector unit in said one pocket, the unit including output means connectible to a device to be powered by the belt and input means connectible to an external power supply;

means adapted to connect in series, electrical cells received in said remaining pockets, and to connect said cells to the connector unit;

and a plug-in coupling for connecting together said inverter unit and said connector unit in one of two positions, in the first of which the inverter unit operates in its normal



mode to invert the d.c. voltage from the cells when the belt is in use, whereby an a.c. voltage is available at said output means, and in the second of which the inverter unit operates as a charger when an external power supply is connected to the input means, to enable the cells to be recharged.

3,919,616

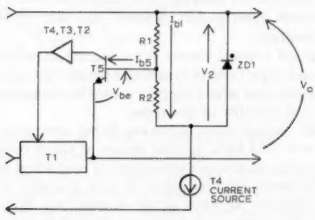
CONSTANT VOLTAGE POWER SUPPLY

Joseph M. Allison, Wesleyville, Pa., assignor to General Systems, Erie, Pa.

Filed Dec. 6, 1972, Ser. No. 312,709

Int. Cl.[2] H02J 7/10; G05F 1/58

U.S. Cl. 320—35 **1 Claim**



1. A power supply circuit for charging a battery having a temperature-voltage coefficient comprising

a voltage supply,

a reference means connected to said voltage supply for controlling the voltage of said supply,

said reference means having a temperature coefficient similar to the said temperature coefficient of said battery being charged,

output means connected to said voltage source, a current source connected to said reference means,

said current source being independent of the voltage of said battery being charged,

a zener diode comprising said reference,

a transistor,

said transistor having a base, an emitter, and a collector,

said base of said transistor being connected to said zener diode,

means for connecting said base emitter voltage to a battery to be charged,

said transistor and said zener being so connected that said output voltage is equal to said base emitter voltage plus a constant times said zener voltage and said constant is equal to or less than one.

3,919,617

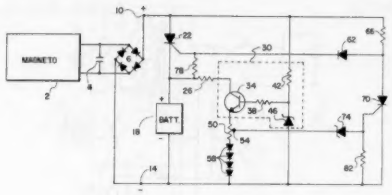
BATTERY CHARGE CONTROL CIRCUIT

Daniel R. Tippett, Fort Worth, and David C. Fricker, Lorene, both of Tex., assignors to ECC Corporation, Euless, Tex.

Filed June 3, 1974, Ser. No. 475,813

Int. Cl.[2] H02J 7/10

U.S. Cl. 320—39 **5 Claims**



1. A circuit for controlling the application of current from a source of full-wave rectified direct current to a battery, said current source including a positive terminal and a negative terminal, said circuit comprising:

a first triode switch having first and second power electrodes and a control electrode, said power electrodes being connected in series between the positive terminal of said current source and the positive terminal of said battery, said first triode switch being responsive to a control signal applied to the control electrode thereof for conducting current from said current source to said battery;

a second triode switch having first and second power electrodes and a control electrode, said power electrodes being connected in series between the positive and negative terminals of said current source, said first power electrode of said second triode switch being further coupled to the control electrode of said first triode switch, said second triode switch being responsive to a control signal applied to the control electrode thereof for controlling the control signal applied to the control electrode of said first triode switch;

a Zener diode coupled to the control electrode of said second triode switch, and

switch means coupled to positive terminal of said battery to the positive terminal of said current source, and to the Zener diode, and responsive to current from said current source for applying at least a portion of the voltage output of said battery to said Zener diode during each half cycle of source current to establish the control signal applied to said second triode switch.

3,919,618

HYSTERESIS BATTERY CHARGER

Charles E. Coleman, Denver, and Ronald O. Hammel, Englewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed June 10, 1974, Ser. No. 477,719

Int. Cl.[2] H02J 7/10

U.S. Cl. 320—39 **22 Claims**

1. A battery charging circuit comprising:

a source of unidirectional charging current;

a series pass element having a control terminal, said series pass element characterized by respective conducting and substantially nonconducting states for controlling charging current to the battery;

means connected across said battery for producing a voltage proportional to the voltage exhibited by the battery;

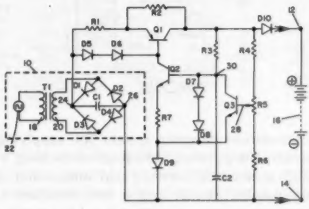
a voltage reference element exhibiting a non-linear voltage drop thereacross dependent upon the magnitude of current being conducted by the non-linear element;

means for comparing said proportional voltage to said voltage reference element and thereby producing a control

signal representative of the difference between said proportional voltage and the voltage exhibited by the voltage reference element;

means responsive to said control signal for rendering said series pass element through its control terminal either in its conducting state or in its substantially non-conducting state;

means for varying the state of current conduction in the voltage reference element between a relatively high conduction state when the series pass element is in its conducting state and a relatively low conduction state when the series pass element is in its substantially non-conducting state;



said voltage reference element exhibiting a relatively higher voltage thereacross when said series pass element is in its conducting state and a relatively lower voltage thereacross when said series pass element is in its substantially non-conducting state;

whereby when said proportional voltage is at or below a first predetermined value the battery charging circuitry initiates delivering high rate charging current to the battery and ceases to deliver high rate charging current to the battery when said proportional voltage reaches or exceeds a second predetermined value which is greater than said first predetermined value.

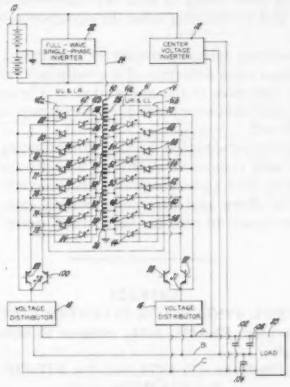
3,919,619

APPARATUS FOR GENERATING THREE-PHASE SINUSOIDAL VOLTAGES

Thomas M. Corry, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed June 5, 1974, Ser. No. 476,695
Int. Cl. H02m *7/52*
U.S. Cl. 321—5 **2 Claims**

1. A three-phase inverter effective to generate three-phase substantially sine-wave voltages across a set of three line conductors comprising: a unidirectional voltage source having a center tap at a neutral potential; a three-phase inverter means connected between the voltage source and the line conductors for producing three-phase, flat-top, full-wave voltages on the respective line conductors in relation to the center tap; a second inverter means connected to said source and operable to produce a single-phase, flat-tap voltage signal alternating between an upper potential and a lower potential at a predetermined frequency; an inductor having a plurality of taps; means for coupling said inductor between said second inverter means and the center tap of the voltage source, whereby flat-top voltage excitation alternating between the upper and lower potential appears thereacross at the predetermined frequency; a first group of controlled rectifiers having their anodes coupled to respective taps of the inductor and their cathodes coupled to a first junction point; a second group of controlled rectifiers having their cathodes coupled to respective taps of the inductor and their anodes coupled to a second junction point; means for selectively gating the controlled rectifiers in the first group to couple the taps of the inductor to the first junction point in ascending order when the excitation across the conductor is at the upper potential to generate a stepped upper left waveform portion and in descending order when the excitation across the conductor is at the lower potential to generate a stepped lower right waveform portion; means for selectively gating the controlled rectifiers in the second group to couple the taps of the inductor to the second junction point in descending order when the excitation across the inductor is at the upper potential to generate a stepped upper left waveform portion and in ascending order when the excitation across the inductor is at the lower potential to generate a stepped lower left waveform portion; means for coupling the upper left, upper right, lower left and lower



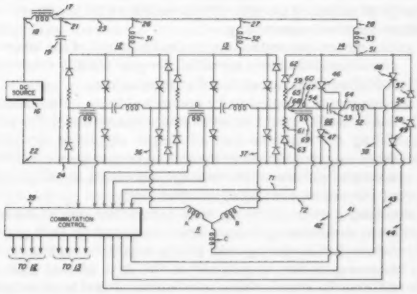
right stepped waveform portions to the three line conductors in timed relation to the three-phase, flat-top, full-wave voltages to approximate a balanced and symmetrical line-to-neutral voltage on each line conductor; a load coupled to the three line conductors; and capacitor means coupled between respective lines of the three line conductors to provide for a line-to-neutral current on each line conductor which leads the approximated balanced and symmetrical line-to-neutral voltage on the respective line conductor by an angle at least equal to the width of the stepped waveform portions.

3,919,620

INVERTER ADAPTIVE LOCK-OUT TECHNIQUE

William McMurray, Schenectady, N.Y.; Allan B. Plunkett, and Thomas D. Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed May 22, 1974, Ser. No. 472,415
Int. Cl. H02m *1/18, 7/52*
U.S. Cl. 321—13 **27 Claims**



1. In a commutation control apparatus for an inverter circuit comprising first and second load current carrying gate

controlled rectifier means connected serially across a source of direct current electric power and first and second commutating gate controlled rectifier means serially connected across said source and commutating circuit means interconnecting the respective junctions of said load current carrying and of said commutating gate controlled rectifier means, said commutation control apparatus being responsive to applied inverter command signals for firing said gate controlled rectifier means in predetermined sequence and comprising:

a. lock-out control means to inhibit firing of said second commutating rectifier means for a period of time commencing upon firing of said first commutating rectifier means and terminating upon the occurrence of a turnoff signal;

b. commutating detection means for providing a commutation signal upon detection of a condition in said inverter circuit indicative of the application of a reverse voltage across said first commutating rectifier means to initiate its turnoff; and

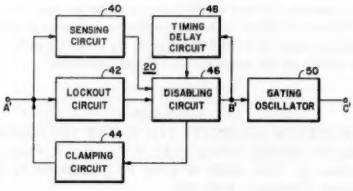
c. gating means coupled to said commutating detection means and responsive solely to a commutation signal occurring after a predetermined first time interval subsequent to firing said first commutating gate controlled rectifier means to produce said turnoff signal.

3,919,621

CONTROL SYSTEM FOR INVERTER CIRCUITS

Reuben Wechsler, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,574
Int. Cl.² H02M *1/18*
U.S. Cl. 321—14 **15 Claims**



1. In an inverter circuit for electromagnetically coupling energy to a load, a control circuit including an input and an output terminal, comprising:

gating means connected to a control terminal of the inverter circuit at said output terminal, for periodically rendering the silicon controlled rectifier conductive;

sensing means adapted to be connected to an output terminal of the inverter circuit at said input terminal, for providing a differential pair of output signals at first and second output terminals thereof, in response to a first and a second portion of the voltage appearing at said anode of the silicon controlled rectifier; and

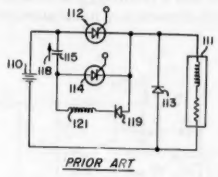
disabling means receiving said differential output signals from said sensing means and connected to said gating means for rendering said gating means nonoperative in response to the magnitude of the first of said pair of differential signals being substantially equal to or greater than the magnitude of the second of said pair of differential output signals whereby the silicon controlled rectifier is rendered nonoperative.

3,919,622

COMMUTATION CHOPPER CIRCUIT WITH INDEPENDENT TRIGGER

Mudhafar A. Al Nema, Mosul, Iraq, and Wellington W. Koepsel, Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Mar. 27, 1974, Ser. No. 455,293
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 C **4 Claims**



1. A commutation chopper system for supplying energy from a constant voltage source to a load comprising: a primary gatable switch connected between said source and said load; a secondary gatable switch and a commutation capacitor connected in series across said first gatable switch; an independent source of voltage and unidirectional current conducting means connected in series circuit between said commutation capacitor and the junction between said first and second gatable switches and of a polarity so as to charge said commutation capacitor when said first gatable switch conducts; and trigger circuit means for applying a first trigger pulse to said first gatable switch to cause the same to conduct and for applying a second trigger pulse to said second gatable switch a predetermined time after said first switch conducts; whereby when said first switch conducts, said commutation capacitor is charged directly by said independent voltage source less only the voltage drops across said conducting first switch and said unidirectional current conducting means, and when said second switch conducts, said commutation capacitor is connected across said first gatable switch in a polarity to shut it off.

3,919,623

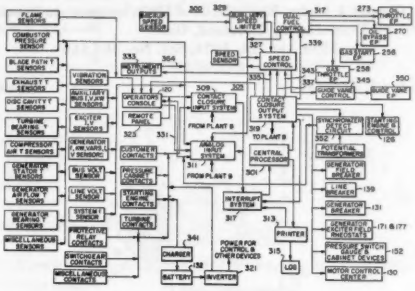
INDUSTRIAL GAS TURBINE POWER PLANT CONTROL SYSTEM HAVING CAPABILITY FOR EFFECTUATING AUTOMATIC FUEL TRANSFER UNDER LOAD PREFERABLY EMPLOYING A DIGITAL COMPUTER

John F. Reuther, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 205,263, Dec. 6, 1971. This application Dec. 21, 1972, Ser. No. 308,892
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H02P *9/04*
U.S. Cl. 322—15 **9 Claims**

1. A gas turbine electric power plant comprising a gas turbine having a compressor and combustion and turbine elements, a generator having a field winding and being coupled to said gas turbine for drive power, a fuel system having plural subsystems for supplying one or more fuels to the gas turbine combustion elements, means for exciting said generator field winding, means for cooperatively operating each of said fuel subsystems to energize said turbine and for controlling said exciting means, a control system for developing one or more fuel system control signals, said control system including a digital computer, an input/output system therefor, and associated external circuit means, said circuit means comprising at least fuel system control signal ratioing means having one or more circuit parameters capable of continuous variation, means for operating said computer to determine a total fuel demand signal value and a time varying ratio of individual fuels necessary to continuously satisfy said total fuel demand

while changing from operation on one of said fuels to operation on another of said fuels, and means for developing a fuel demand signal corresponding to said determined total fuel



demand value and for applying said signal across said fuel signal ratioing means to derive individual control inputs to each of said plural fuel subsystem operating means.

3,919,624
SELF COMMUTATING STATIC CONVERTER

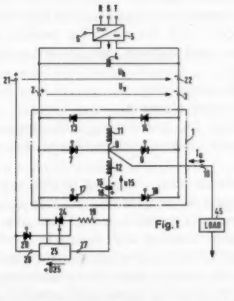
Hermann Tappeiner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 6, 1975, Ser. No. 547,601

Claims priority, application Germany, Feb. 22, 1974, 2408609

Int. Cl.² H02M *7/505, 7/515*

U.S. Cl. 321—45 C **12 Claims**



1. In a self commutating static converter of the type having two controlled main rectifiers in series which are connected across a d-c supply voltage source, a bypass rectifier being associated with each of the main rectifiers, and having an arrangement for forced commutation containing at least one commutation choke and a commutation capacitor which is common to both main rectifiers and is used, along with an individual quenching rectifier associated each main rectifier, in order to extinquish the main rectifiers, the improvement comprising;

a. an auxiliary voltage source;

b. a controlled recharging rectifier having one side coupled to said auxiliary voltage source;

c. a recharging resistor coupling the other side of said recharging rectifier to the commutation capacitor;

d. a controlled discharging rectifier coupling said commutation capacitor to the d-c supply voltage source; and

e. means for firing said discharge rectifier when the voltage at the commutation capacitor exceeds a predetermined limit.

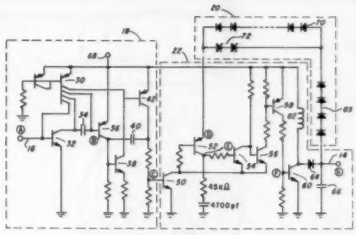
3,919,625
DC-DC CONVERTER IN WATCH SYSTEM

Troyce D. Barton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1974, Ser. No. 454,052

Int. Cl.² G05F *1/58*

U.S. Cl. 323—17 **5 Claims**



4. A DC to DC voltage converter comprising:

a. one-shot multivibrator means responsive to an oscillatory input signal for generating a series of one-shot signals having controlled pulsewidths; and

b. a switching regulator coupled to said one-shot multivibrator means and adaptive to receive a supply voltage of a first magnitude for generating a DC output voltage of magnitude substantially greater than said first magnitude, said regulator including a serially connected inductor, diode, and capacitor combination such that the field of said inductor cyclically charges and collapses in response to said series of signals, and said capacitor charges in response to the collapse of said inductor field to provide said DC output voltage and temperature compensation feedback means coupling said capacitor to the input of said switching regulator for adjusting said output voltage in accordance with temperature changes, said feedback means including a first set of unidirectionally series connected P-N junction devices and a second set of unidirectionally series connected P-N junction devices connected in parallel with selected ones of devices of said first set, said second set connected in the reverse polarity direction from that of said first set.

3,919,626
MEASURING TRANSFORMER ARRANGEMENT

Wolfgang Hermstein, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,902

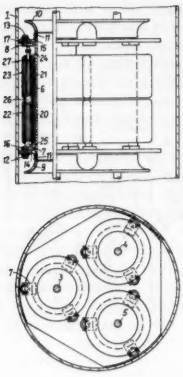
Claims priority, application Germany, May 17, 1973, 2325442

Int. Cl.² H01F *40/08, 40/10, 27/00;* **H01B** *9/06*

U.S. Cl. 323—93 **16 Claims**

1. A measuring transformer arrangement for an installation having a gas-filled tubular enclosure wherein a plurality of high-voltage conductors are arranged, the measuring voltage arrangement comprising: a plurality of current transformer units corresponding to respective ones of the high-voltage conductors; structure means for holding said current transformer units in spaced relation to corresponding ones of the high-voltage conductors respectively; each of said current transformer units including an individual iron core, and a secondary winding system mounted on said iron core; and, a plurality of control electrodes corresponding to respective

ones of said plurality of current transformer units, each of said control electrodes being arranged with respect to the corresponding iron core to shield the same from the high-voltage of the corresponding high-voltage conductor.



3,919,627

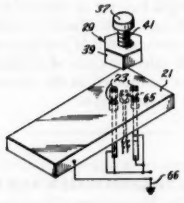
CONDUCTIVITY MEASURING METHOD AND APPARATUS UTILIZING COAXIAL ELECTRODE CELLS

Gerald F. Allen, 532 Bucknell Ave., Claremont, Calif. 91763

Continuation-in-part of Ser. No. 61,738, Aug. 6, 1970, abandoned. This application May 31, 1973, Ser. No. 365,617

Int. Cl.² G01N *27/42*; G01R *27/02*

U.S. Cl. 324—30 R **18 Claims**



1. An apparatus for use in measuring the conductivity of a sample comprising:

a central cylindrical electrode having a smooth, continuous surface for contact with said sample,

an annular electrical insulator surrounding said central electrode and in contact therewith, said insulator having a smooth, continuous contact surface in the same plane as the contact surface of said central electrode, and

an outer electrode surrounding said insulator and in contact therewith said outer electrode having a smooth, continuous contact surface in the same plane as the contact surfaces of said central electrode and said insulator, said central electrode, insulator and outer electrode forming a continuous, smooth plane surface for contact with said sample.

3,919,628

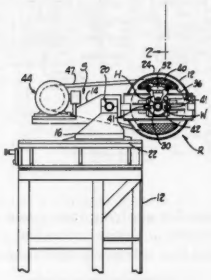
METHOD AND APPARATUS FOR ROTATING A FLAW DETECTOR ABOUT A TEST PIECE AND GUIDING IT RELATIVE TO UNDULATIONS AND BENDS

Joseph M. Mandula, Seven Hills; John P. Baraona, Parma, and Chester J. Mates, Eastlake, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Apr. 26, 1974, Ser. No. 464,569

Int. Cl.² G01R *33/12*

U.S. Cl. 324—37 **6 Claims**



1. Apparatus for nondestructively inspecting elongated workpieces having relatively small diametrical extents and moving along a path of travel comprising:

a. a support unit disposed about said path of travel;

b. structure supporting said support unit for rotation about a first axis generally coextending with said path of travel;

c. drive means for rotating said support unit about said first axis;

d. an inspection head carried by said support unit for rotation therewith; and,

e. a head support member coupled between said head and said support unit for enabling movement of said head relative to said support unit toward and away from said first axis;

f. said head comprising:

i. a supporting element;

ii. structure for connecting said supporting element to said head support member for relative universal movement;

iii. a guide structure coupled to said supporting element for pivotal movement relative to a second axis extending generally parallel to said first axis and comprising a support housing and divergent workpiece engaging surfaces which project from said housing and engage said workpiece to track along undulations in the workpiece by pivoting about said second axis as said surfaces move about the workpiece;

iv. a sensor assembly supported at least partly within said support housing for pivotal movement with said guide structure about said second axis and including a portion projecting from said support housing toward said first axis;

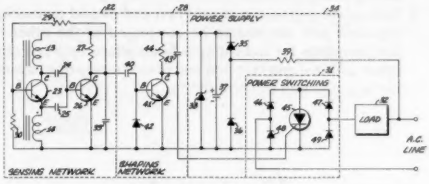
v. bearing elements connecting said sensor assembly to said support housing for pivotal movement relative to said guide structure about a third axis extending generally transverse to said second axis and for translational movement relative to said support housing toward and away from said first axis; and,

vi. means for biasing said sensor assembly toward engagement with a workpiece engaged by said workpiece engaging surfaces, said means for biasing said sensor assembly cooperating with said bearing elements to maintain said sensor assembly in engagement with workpiece undulations disposed generally in a plane extending through said first and second axes relative to the sensor assembly.

3,919,629
PROXIMITY SENSING DEVICE USING AN INDUCTANCE AND CAPACITANCE RESONANT BRIDGE NETWORK

Carol L. Scruggs, 52500 Southdawn, Utica, Mich. 48087

Filed Nov. 5, 1973, Ser. No. 412,742
Int. Cl.² G01R 33/12
U.S. Cl. 324—41 3 Claims



1. A proximity sensor apparatus for sensing metallic materials comprising:

a bridge sensing network including a first transistor including base, emitter and collector terminals, a first coil and a first capacitor connected at first ends thereof to the emitter of said first transistor, a second coil and a second capacitor having a capacitance value equal to that of said first capacitor connected at first ends thereof to the collector of said transistor, the second end of said first coil connected to a first potential source voltage and the second end of said second coil connected to a second potential source voltage, the second end of said first and second capacitor connected together and to a base terminal of a second transistor including an emitter and collector terminals, said second transistor being biased to amplify output signals from said first transistor, a feedback means connected between the collector of said second transistor and the base of said first transistor;

a threaded ferrous insert placed as a common core to both said first and second coils and adjusted such that the inductance of said first coil equals the inductance of said second coil;

a ferrous set screw having threads matching said threaded ferrous insert, said set screw adjusted within said treaded ferrous insert to increase the inductance of said second coil, said second coil and said second capacitor generating imbalance signals thereby to cause said second coil and said second capacitor to generate imbalance signals and with said second transistor and said feedback means to generate oscillation signals; and

a switching network connected to receive said oscillation signals and actuably thereby to inactivate a utilization means;

wherein when the ferrous material to be sensed is brought adjacent said first coil, said first coil and said first capacitance generate balancing-opposing signals to said imbalance signals to stop the generation of oscillation signals and thereby actuate said switching network to activate the utilization means.

3,919,630
FLUX DETECTION DEVICE USING A PARAMETRICALLY EXCITED SECOND HARMONIC OSCILLATOR

Shintaro Oshima, Musashino; Teruji Watanabe, Niza, and Takasuke Fukui, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

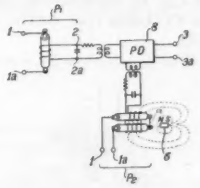
Continuation-in-part of Ser. No. 96,190, Dec. 8, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 294,497
Claims priority, application Japan, Dec. 10, 1969, 44-98637
Int. Cl.² G01R 33/02
U.S. Cl. 324—43 R 6 Claims

1. A flux detection device for detecting a non-uniform magnetic field comprising a parametrically excited second harmonic oscillator comprising:

two magnetic sensors each comprising a straight electrical conductor having a ferromagnetic thin film coated circumferentially and axially on the respective straight conductor so as to have a circumferential easy magnetization direction

means connecting the conductors of said two magnetic sensors in series;

inductance means comprising two inductors each having an equal number of turns wound insulatively circumferentially on a respective one of the two magnetic sensors and connected differentially in series for detecting an external non-uniform magnetic field;



means for applying an exciting current to the conductors of the two magnetic sensors connected in series;

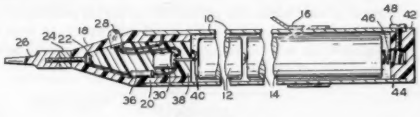
a capacitor connected in parallel with the two inductors to form a parallel resonance circuit having a resonance frequency equal to a second harmonic frequency of the frequency of the exciting current for developing a second harmonic component therein having either one of two possible phases in accordance with the existence or nonexistence of a magnetic field nonuniformly effective on said two magnetic sensors; and

detection means coupled to said resonance circuit for detecting the oscillatory phase of the second harmonic component which is generated in the resonance circuit.

3,919,631
LEADLESS PROBE

Richard D. Brown, P.O. Box 264, 1730 Yellow Fir Road, Tillamook, Oreg. 97141

Filed July 5, 1973, Ser. No. 376,540
Int. Cl.² G01R 31/02
U.S. Cl. 324—51 2 Claims



1. A probe for indicating electrical continuity comprising:

a hand-held body, said body comprising an outer tubular electrically conductive portion for making electrical connection with the hand of a user;

an electrical connecting member supported by said body and electrically insulated from said outer tubular electrically conductive portion, said electrical connecting member including a threadably received removable tip connection;

a high input impedance amplifier housed in said body, said amplifier comprising a Darlington transistor amplifier having an input directly coupled to the electrical connecting member;

an output means integral with said body and responsive to said amplifier for producing an output;

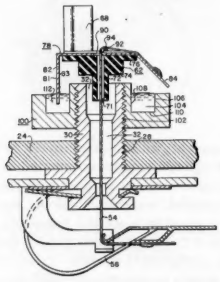
and a power supply housed in said body and directly electrically connected to said outer tubular electrically conductive portion, said power supply acting alone to energize said output means through an electrically continuous

path, said path including, in electrical series, said power supply means, said outer tubular electrically conductive portion, the hands and body of the user, a device under test, said electrical connecting member, said high impedance amplifier, and said output means, whereby the electrical continuity of said device under test may be indicated.

3,919,632
FLUID DAMPING SYSTEM FOR ANALOG INSTRUMENTS

Dennis F. Roerty, Bayonne, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1974, Ser. No. 502,128
Int. Cl.² G01R 1/14; G01D 11/10
U.S. Cl. 324—125 **13 Claims**

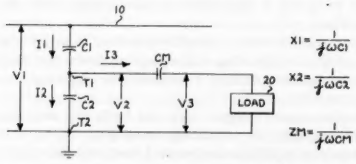


1. An electrical measuring instrument comprising:
a stator unit,
a rotor unit,
mounting means mounting the rotor unit on said stator unit for movement relative to said stator unit,
damping means for damping said relative movement,
said damping means comprising a receptable member carried by one of said units and having an outwardly opening aperture, said aperture having side and end walls, a damping member carried by the other of said units and having at least a portion thereof positioned within said aperture, and a highly viscous liquid damping fluid within said aperture and through which said portion of said damping member moves as a consequence of the relative movement of said units, the properties of said liquid fluid being so related to the dimensions of said aperture that said liquid fluid will be retained within said aperture against the force of gravity.

3,919,633
HIGH VOLTAGE MEASURING DEVICE

Theodore Brenig, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Continuation-in-part of Ser. No. 458,524, April 8, 1974, abandoned. This application Nov. 26, 1974, Ser. No. 527,500
Int. Cl.² G01R 19/00; H02H 7/16
U.S. Cl. 324—126 **4 Claims**



1. In a high voltage system having a line, a first terminal, a first capacitor of magnitude C1 connected between said line and said first terminal, a second terminal, a second capacitor of magnitude C2 connected between said first terminal and said second terminal, an improved arrangement for measuring the voltage between said line and said second terminal comprising:

a. a measuring capacitor of magnitude CM having a first end adapted to be connected to one of said terminals and having a second end;

b. first means connected to said first end of said measuring capacitor and adapted to be connected to the other of said terminals for indicating a first voltage between said other terminal and said first end of said measuring capacitor as a function of the ratio

$$\left(\frac{C1 + C2 + CM}{C1}\right)$$

c. second means connected to said second end of said measuring capacitor and adapted to be connected to said other terminal for indicating a second voltage between said other terminal and said second end of said measuring capacitor as a function of the ratio

$$\left(\frac{CM}{C1}\right)$$

d. and third means connected to said first and second means for indicating the difference between said first and second voltages.

3,919,634
CURRENT ARRANGEMENT FOR CORRECTING THE MEASURED VOLTAGE OF AN ANALOG SPEED, TRANSDUCER

Horst Appel; Klaus Bohm, and Gerhard Gleissner, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 13, 1974, Ser. No. 469,642
Claims priority, application Germany, May 16, 1973, 2324824
Int. Cl.² G01P 3/48; H02P 5/00
U.S. Cl. 324—163 **6 Claims**

1. A circuit arrangement for correcting the measured voltage of an analog speed transducer comprising:

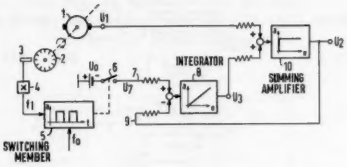
a. a digital speed transducer rotating with the same speed as the analog speed transducer and providing an output which is a speed proportional pulse train;

b. means to convert said speed proportional pulse train into a pulse train having the same period as said speed proportional sequence but having pulses of constant voltage-time area;

c. a summing amplifier having as one input the output of the analog speed transducer and providing at its output a corrected measured voltage; and

d. an integrator having as a controlled variable input the

output of said summing amplifier and as a reference input said pulse train having pulses of constant voltage-time



areas, and providing its output as a second input to said summing amplifier.

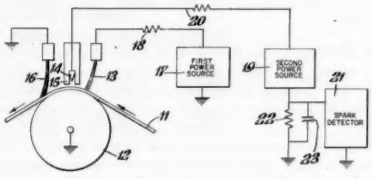
3,919,635
APPARATUS AND METHOD FOR DETECTING HOLES IN DIELECTRIC SHEET MATERIALS

James Harold Bowen, Hillsborough Township, and Edward Flowers, South Plainfield, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 138,245, April 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 956,577, Sept. 10, 1969, abandoned. This application Jan. 19, 1973, Ser. No. 325,083

Int. Cl.² G01R *31/12*

U.S. Cl. 324—54 **11 Claims**



1. Apparatus for detecting small holes in a sheet of dielectric material comprising, in combination:

electrically conductive means in electrical contact with one surface of said sheet material;

an electrical ground in circuit with said electrically conductive means;

an electrical charging electrode impinging on the other surface of said sheet material;

a first electric power source in circuit with said electrical charging electrode, and said electrical ground for imposing an electrical charge on said other surface of said sheet material;

a detector electrode disposed adjacent said other surface of said sheet material in electrical spark gap spaced relationship to the first recited electrically conductive means;

a second power source in circuit with said detector electrode;

spark detector means in circuit with said detector electrode for detecting the spark gap current flow between said detector electrode and said grounded electrically conductive means when a hole in the sheet material is in registration therewith; and

means for continually moving said sheet of dielectric material first into contact with said electrical charging electrode and then past said detector electrode.

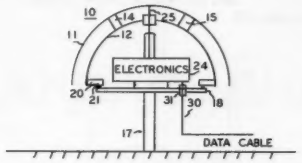
3,919,636
ELECTRICAL FIELD CHANGE METER

Arthur A. Few, Houston, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1974, Ser. No. 465,042

Int. Cl.² G01R *31/02*

U.S. Cl. 324—72 **4 Claims**



1. An improved electrical field change meter for accurately measuring changes in the atmospheric electrical field comprising:

a. a first irregularly shaped metal capacitor plate;

b. a second irregularly shaped metal capacitor plate having a shape substantially identical to said first plate;

c. insulating standoff means for spacing said first plate a fixed distance from said second plate to effect a capacitor;

d. a base plate;

e. means for mounting said capacitor to said base plate;

f. electrical circuitry being deposited between said base plate and said capacitor for measuring current flow from said first plate to said second plate;

g. a first conductor means from said electrical circuitry led thru said base plate to a ground for providing an accurate reading of the current flow;

h. a second conductor means from said electrical circuitry led thru said base plate to supply power and to remove electrical data therefrom; and,

i. sealing means for providing weather proofing between said base plate and said capacitor.

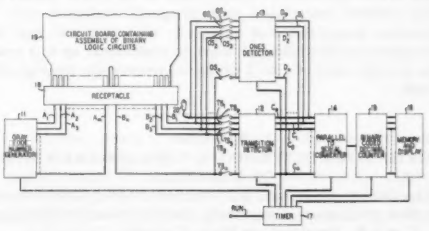
3,919,637
LOGIC CIRCUIT FAULT DETECTOR

Ronald Lee Earp, Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1974, Ser. No. 472,115

Int. Cl.² G01R *15/12*

U.S. Cl. 324—73 R **3 Claims**



1. In test apparatus which produces a sequence of Gray code binary number related sets of outputs for application to the input terminals of a binary circuit assembly to be tested and, furthermore, which detects transitions between first and second levels on the output terminals of said assembly and indicates the number of said transitions occurring during said sequence, the improvement comprising the addition of means for detecting each time said first level occurs on at least one of said output terminals in response to each of said sets of outputs for indicating the number of said first levels occurring

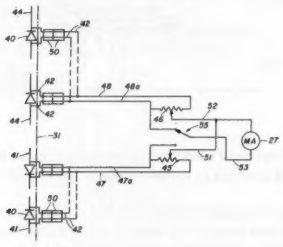
during said sequence, which numbers may be compared to known reference numbers.

3,919,638

MICROWAVE DETECTION INSTRUMENT

Lorne H. Belden, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 10, 1973, Ser. No. 387,540
Int. Cl.² G01R *21/04, 31/02*
U.S. Cl. 324—95 **9 Claims**



1. A passive field instrument for detecting microwave electromagnetic radiation and measuring the power density thereof regardless of any modulation thereof and while consuming only the power thereof, said instrument comprising an array of diode detectors each having a pair of output conductors and each having an effective square-law response region wherein the diode detector output is proportional to the power density of the incident microwave electromagnetic radiation, the extent of said effective square-law response region varying generally inversely with the D.C. load impedence of said diode detector, means connected to the output conductors of each of said diode detectors for measuring the additive total rectified output of said diode detectors, and a plurality of ferrite members equal in number to said diode detectors and respectively coupled directly thereto and disposed between said diode detectors and said measuring means for presenting a high R.F. impedance and a low D.C. impedance to the retified output of said diode detectors, both of said output conductors of each diode detector passing directly through the associated one of said ferrite members thereby to maximize the extent of said effective square-law response region, and means interconnecting said diode detectors, said diode detectors being interconnected only bewtween said measuring means and said ferrite members, whereby the output of said instrument is proportional to the power density of the incident microwave electromagnetic radiation over a range of power densities sufficiently wide to render said instrument substantially insensitive to modulation up to a peak to average ratio of 5 to 1 of the microwave electromagnetic field.

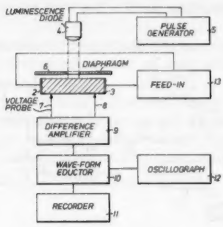
3,919,639

METHOD FOR DETERMINING THE CARRIER LIFETIME OF A CRYSTAL

Klaus Graff, Heilbronn, and Heinrich Pieper, Frankenbach, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 3, 1973, Ser. No. 421,165
Claims priority, application Germany, Dec. 2, 1972, 2259131
Int. Cl.² G01R *31/26*
U.S. Cl. 324—158 R **8 Claims**

1. In a method for determining the carrier lifetime of semiconductor crystals wherein the decay time of the photo conductivity of the semiconductor crystal is measured after the application of a light pulse thereto, the improvement wherein the light intensity of the light acting on the semiconductor crystal is chosen to be sufficiently small so that the relationship of the charge carriers produced by light action in the



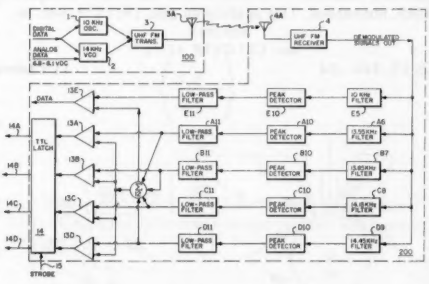
semiconductor crystal to the majority charge carriers present in the semiconductor crystal before the light action is smaller than 10^{-3}.

3,919,640

SIMULTANEOUS ANALOG AND DIGITAL DATA TRANSFER

Walter Simciak, Longwood, Fla., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Nov. 8, 1974, Ser. No. 521,953
Int. Cl.² H04B *1/00*
U.S. Cl. 325—30 **6 Claims**



1. An apparatus for simultaneously transmitting via electromagnetic waves analog and digital data signals to a mobile or fixed central station from a selected transponder associated with a selected one of said plurality of remote meter reading stations, said analog data signals representing the voltage level of a battery which supplies electric power to said selected remote transponder, and said digital data signals representing information obtained by said selected transponder from its associated remote meter reading station, said apparatus comprising:

a. frequency shift key (FSK) means in each of said remote transponders for encoding digital data at a predetermined frequency for wireless transmission to said mobile or fixed central station from a selected one of said remote transponders;

b. voltage control (VCO) means in each of said remote transponders, one each of said FSK means being coupled to one each of said VCO means, said VCO means for shifting the frequency of its associated FSK means in proportion to the voltage level supplied by a battery associated to said selected one of said remote transponders; and,

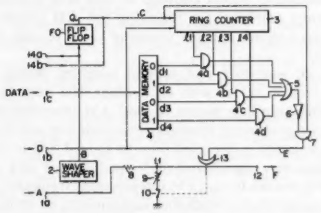
c. UHF FM transmitting means in each of said remote transponders for wirelessly transmitting to said fixed or central station from a selected one of said transponders the FSK encoded digital information signals and the analog frequency shifted information signals representative of the battery voltage level.

3,919,641

DATA TRANSMISSION UTILIZING MODULATION OF ALTERNATE CARRIER CYCLES

Akira Kurokawa, Kawasaki, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 21, 1974, Ser. No. 471,982
Claims priority, application Japan, May 28, 1973, 48-58567
Int. Cl.² H04B 1/00
U.S. Cl. 325—38 R **5 Claims**



1. Data transmission system utilizing modulation of alternate carrier wave cycles comprising:

means for modulating said carrier wave so that said carrier wave is defined into a plurality of blocks and all the cycles but one at least within each of said blocks are subjected to amplitude modulation by a data signal;

means for recording or transmitting said modulated wave;

means for demodulating said modulated wave comprising means for comparing the amplitude of said unmodulated cycle of said recorded or transmitted wave with the amplitude of said modulated cycle in the same block and means for reproducing said data from the output of said comparing means;

said modulating means comprising

means for generating a first square wave having a width equivalent to multiples of one cycle of said carrier wave;

means for feeding a head formation signal;

means for storing said data signal for modulating said carrier wave in a first data memory;

a ring counter supplied with said head formation signal and said first square wave to produce sequentially a plurality of second square waves defining said blocks; and

gating means supplied with said head formation signal, said data signal stored in said first data memory, said first square wave and said second square wave to modulate said carrier wave by said head formation signal and said data signal.

3,919,642

LOW COST TELEMETER FOR MONITORING A BATTERY AND DC VOLTAGE CONVERTER POWER SUPPLY

Floyd Allen, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

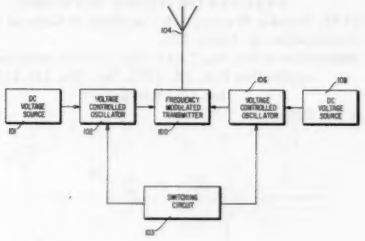
Continuation-in-part of Ser. No. 358,565, May 9, 1973, abandoned. This application May 17, 1974, Ser. No. 470,778
Int. Cl.² H04B 1/04
U.S. Cl. 325—113 **7 Claims**

1. A telemetry circuit for transmitting an F-M signal indicative of a pair of DC voltages in a projectile fuze, which comprises:

first and second sources of varying DC voltages;

first and second voltage-controlled oscillator means, each having an oscillation transistor and a frequency determining capacitor, responsive to the outputs from said first and second sources of DC voltages, respectively, for producing first and second oscillating signals whose frequencies are respectively proportional to the magnitude of said first and second DC voltage source outputs;

means for transmitting a frequency modulated carrier wave which alternately receives said first and second oscillating signals for use as the modulating signal for said carrier wave; and



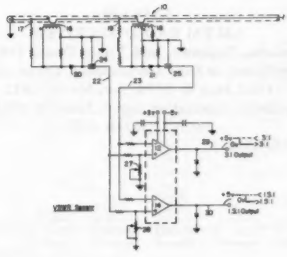
control means for alternately disabling said first and second voltage controlled oscillator means whereby said transmitting means receives only a single modulating signal at any given time, said control means comprising means for producing a constant frequency oscillating signal and switching means responsive to said constant frequency oscillating signal for alternately grounding said frequency determining capacitor of said first and second voltage-controlled oscillator means, respectively.

3,919,643

PHASE SENSOR CIRCUIT

Lawrence R. Templin, La Mirada, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 251,232, May 8, 1972, Pat. No. 3,794,941. This application Jan. 28, 1974, Ser. No. 437,436
Int. Cl.² H03G 11/04
U.S. Cl. 325—150 **14 Claims**



1. A phase sensor circuit for detecting the phase of signal transmission comprising:

circuit means for sampling undetected voltage and current of said signal transmission capable of having loads of a capacitive or inductive phase angle to produce voltage and current samples;

phase detection circuit means comprising a reference circuit including at least one logical gating circuit for receiving one of said samples to provide a pulse output and a delay circuit including a plurality of logical gating circuits for receiving the other of said samples to provide a delayed pulse output; and

a summing logical gating circuit means having an input for receiving the pulse outputs of said reference circuit and delay circuit to provide a pulsed output for one phase load and steady state output for the other phase load, in

response to reference and delayed signals at the input of the summing circuit.

3,919,644

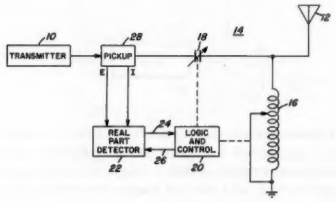
AUTOMATIC ANTENNA COUPLER UTILIZING SYSTEM FOR MEASURING THE REAL PART OF THE COMPLEX IMPEDANCE OR ADMITTANCE PRESENTED BY AN ANTENNA OR OTHER NETWORK

Carl M. Smolka, Wayne, N.Y., assignor to General Dynamics Corporation, St. Louis, Mo.

Continuation of Ser. No. 7,619, Feb. 2, 1970, abandoned. This application Feb. 18, 1972, Ser. No. 229,215

Int. Cl.[2] H04B *1/04*

U.S. Cl. 325—174 **12 Claims**



1. A system for transforming the complex load which has electrical impedance and admittance characteristics presented by an electronic signal untilization device which receives signals, which system comprises:

an adjustable reactive element connected to said electronic signal utilization device and forming part of said load;

detection means response to the signals applied to said device for providing an error signal having a magnitude corresponding to the magnitude of the real part of one of said admittance and impedance of said load; and

means responsive to said error signal for adjusting said element until said error signal reaches a predetermined magnitude.

3,919,645

AM/FM RADIO RECEIVER

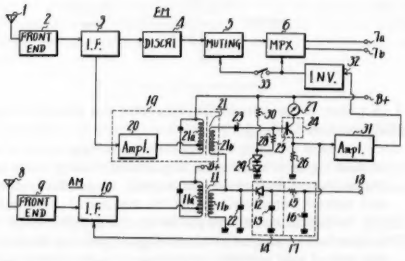
Mitsuo Ohsawa, Fujisawa, and Yukio Onoe, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 6, 1974, Ser. No. 477,012

Claims priority, application Japan, June 19, 1973, 48-68895

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—316 **5 Claims**



1. An AM/FM radio receiver for selectively reproducing audio information transmitted thereto by AM or FM transmission, comprising:

a tunable FM section for receiving an FM signal and including an FM intermediate frequency amplifier, an FM demodulator coupled to said FM intermediate frequency amplifier, and output means coupled to said FM demodulator for receiving said audio information;

a tunable AM section separate from said FM section for receiving an AM signal and including a gain controllable AM intermediate frequency amplifier, an AM demodulator coupled to said AM intermediate frequency amplifier, and output means coupled to said AM demodulator for receiving said audio information;

first coupling means coupled to said FM intermediate frequency amplifier for receiving the FM intermediate frequency signal and for coupling same to further means;

second coupling means coupled to said AM intermediate frequency amplifier for receiving the AM intermediate frequency signal and for coupling same to said further means;

portions of said first and second coupling means being connected in series with each other, the impedance of said first coupling means to said AM intermediate frequency signal being relatively low such that substantially no attenuation is imparted thereby to said AM intermediate frequency signal, and the impedance of said second coupling means to said FM intermediate frequency signal being relatively low such that substantially no attenuation is imparted thereby to said FM intermediate frequency signal;

a transistor having its base-emitter circuit connected in series with said portions of said first and second coupling means to receive said FM and AM intermediate frequency signals, the base-emitter junction of said transistor rectifying the signals applied thereto to produce a direct current having a magnitude determined by the amplitude of said applied signals;

indicating means connected to the collector of said transistor for indicating the magnitude of said produced direct current to thereby indicate the tuning condition of said receiver with respect to the received FM and AM signals; and

means coupled to the emitter of said transistor and responsive to said magnitude of said produced direct current to control the gain of said AM intermediate frequency amplifier and to control the operation of said FM section output means so as to permit the stereo reproduction of a received stereo FM signal and to permit interstation muting during tuning of said FM section.

3,919,646

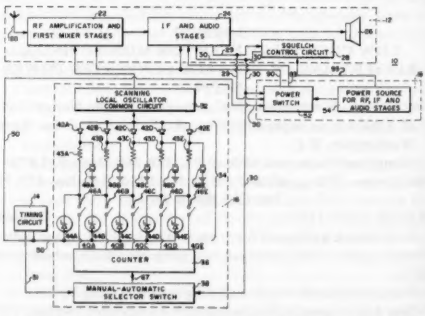
SCANNING RECEIVER

Eugene L. Morgan, Lincoln, Nebr., assignor to Hy-Gain Electronics Corporation, Lincoln, Nebr.

Filed May 6, 1974, Ser. No. 467,456

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—470 **9 Claims**



1. A radio receiver comprising means for receiving radio frequency electrical energy and signal processing means for selecting certain wavelengths of said radio frequency electrical energy and for producing audio intelligence from said

wavelengths of radio frequency electrical energy, said signal processing means comprising:

a plurality of pulse-controlled circuits for intermittent operation upon the application of electrical pulses;

a pulse generator;

means for connecting said pulse generator to certain of said plurality of pulse-controlled circuits during at least a portion of the operation of said radio receiver, whereby certain portions of said radio receiver operate intermittently so as to conserve power;

variable tuning means for selecting certain wavelengths of said radio frequency electrical energy;

said variable tuning means comprising at least one mixer;

variable frequency oscillator means for applying any one of several different frequencies to said mixer, whereby certain wavelengths of said radio frequency energy are selected;

a counter for providing counts represented by output potential levels on counter output terminals; and

scan-control means for preventing counting of said counter while said radio receiver is receiving electrical energy at one of said certain wavelengths;

said variable frequency oscillator means including means for applying signals of said different frequencies to said mixer in response to corresponding counts of said counter;

said pulse generator being electrically connected to said counter whereby said counter is counted by said pulse generator to cause variable frequency oscillator means to apply a series of different frequencies to said mixer in response to said output potential levels;

said pulse generator including pulse means for applying a series of pulses of predetermined duration to at least some of said pulse-controlled circuits, which predetermined durations are less than the durations of certain of said output potential levels;

said pulse-controlled circuits including a plurality of lamps; each of said lamps indicating a different one of certain of said selected frequencies, whereby said lamps are illuminated to indicate the frequency being scanned for a period of time shorter than the time said counter is at a corresponding stage;

each of said lamps including first and second terminals;

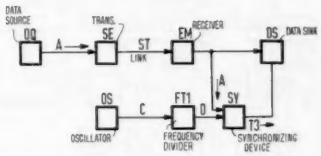
each of said first terminals being electrically connected to said pulse means for applying a series of pulses of predetermined durations to at least some of said pulse-controlled circuits, whereby pulses having a duration less than the duration of certain of the output potential levels are applied to said first terminal of said certain of said lamps;

each of said second terminals of said certain lamps being electrically connected to a different one of said counter output terminals, whereby a circuit is completed from the pulse means and a selected counter output terminal for said duration less than the duration of certain of the output potential levels.

a frequency divider whose input is coupled to the output of said frequency changing device and whose output comprises the phase adjusted timing signal,

a discriminator responsive to an output of said frequency divider and a binary signal for providing an input signal to said frequency changing device,

a coder storing an adjustment characteristic to be applied to the received signal to be adjusted,



said frequency divider comprising a plurality of stages, the output of each stage being coupled to the input of said coder, said coder assigning code values to the signals received from each output of said frequency divider on the basis of said adjustment characteristic,

and means for coupling the coded output signals of said coder to a third input of said frequency changing device.

3,919,647

CIRCUIT ARRANGEMENT FOR ADJUSTING THE PHASE STATE OF A TIMING SIGNAL

Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 29, 1974, Ser. No. 518,814

Claims priority, application Germany, Oct. 29, 1973, 2354103

Int. Cl.² H04B *1/02*

U.S. Cl. 328—155 **4 Claims**

1. A circuit for adjusting the phase state of a timing signal comprising

a frequency changing device receiving the signal to be adjusted

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3,919,648

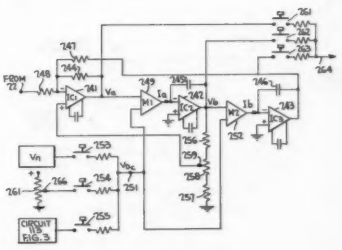
VOLTAGE-CONTROLLED FILTER

Dale M. Uetrecht, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed June 15, 1973, Ser. No. 370,303

Int. Cl.² G10H *1/02, 5/04;* **G06G** *7/16;* **H03F** *1/34*

U.S. Cl. 328—167 **12 Claims**



1. An audio frequency filter comprising in cascade in the order recited, a first operational amplifier, a two quadrant first multiplier, a second integrating operational amplifier having two inputs, a second two quadrant multiplier, a third integrating operational amplifier, a source of audio signal applied to a first input of said first operational amplifier, means for applying multiplicative voltage factors respectively to both said first multiplier and said second multiplier, means for feeding back output from said second operational amplifier to a second input of said first operational amplifier, means for feeding back output from said third operational amplifier to said first input of said first operational amplifier, and means for deriving separate audio signal outputs from each of said operational amplifiers.

3,919,649
STAIRCASE WAVEFORM GENERATOR

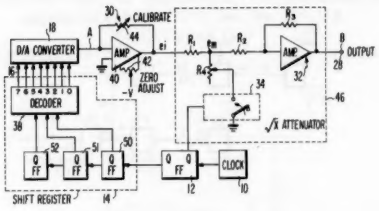
Hugo Logemann, Jr., Concord, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,356

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H03K *4/02*

U.S. Cl. 328—186 **10 Claims**



2. An apparatus for generating a waveform comprising:

means for generating a multilevel digital waveform having a progression of step transitions wherein each step transition differs in value from the next adjacent step transition by a factor having a first value, and

means selectively coupled to said generating means altering by a second value a selected portion of each said step transition during a selected time interval intermediate each shift in value of level of said waveform to produce a multilevel waveform wherein each level differs in value from the next adjacent level by said second value.

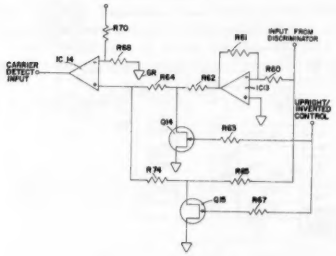
3,919,650
MARK FREQUENCY DETECTOR CIRCUIT

Richard D. Fretwell, Columbus, Ohio, assignor to MI², Columbus, Ohio

Filed Aug. 15, 1973, Ser. No. 388,635

Int. Cl. H03d *3/14*

U.S. Cl. 329—102 **8 Claims**



1. A mark frequency detector circuit for a data coupler for detecting mark and space frequency signals comprising:

ground means,

input means for receiving a positive signal indicative of a mark frequency in the upright mode of operation and a negative signal as a space frequency and a negative signal indicative of a mark frequency in the inverted mode of operation and a positive signal as a space frequency, said signals having a representative value;

a first and second switching means receiving said input signals, the first of said switching means operative in response to said positive signal and the second of said switching means operative in response to said negative signal;

inverting means having the output of said negative responsive switching means connected thereto and voltage comparison means having the output of said inverting means connected thereto;

in upright mode of operation said positive output of said input means is connected to said voltage comparison means and the output of said inverter is shunted to said ground means,

reference voltage determining means connected to said voltage comparison means for comparing the output signals from said switching means with a reference voltage.

3,919,651
PHASE DIFFERENTIAL MODULATION FREQUENCY AUTOMATIC CORRECTING DEVICE

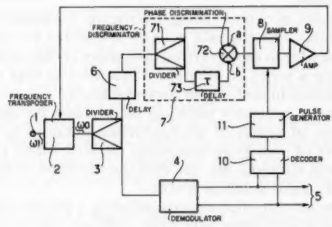
Bernard Le Mouel, La Roche Derrien, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel, France

Filed Apr. 19, 1974, Ser. No. 462,533

Claims priority, application France, Apr. 19, 1973, 73.14467

Int. Cl.² H03D *3/18;* **H04L** *27/22*

U.S. Cl. 329—104 **7 Claims**



1. An automatic frequency corrector for a local oscillator used for a frequency transposition for a demodulator of a differential phase modulated wave comprising a phase discriminator receiving on a first input said modulated wave and on a second input the same modulated wave delayed by an instant τ, a sampling unit having one input connected to the output of said phase discriminator, a pulse generator connected to a second input of said sampling unit, and control means responsive to said modulated wave for triggering said pulse generator at the instants when the output of said phase discriminator is zero at a selected frequency and when the output of said phase discriminator is non-zero at all other frequencies.

3,919,652
SPLIT-PHASE SIGNAL DETECTOR

Albertus Marinus Morrien, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,432

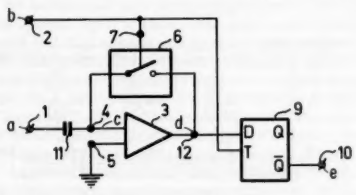
Claims priority, application Netherlands, Dec. 14, 1972, 7216972

Int. Cl.² H04K *9/04*

U.S. Cl. 329—104 **1 Claim**

1. A split-phase signal detector, comprising a signal input terminal means for receiving a split-phase Manchester-coded binary signal to be detected, a clock pulse input terminal means for receiving a clock pulse signal which has the same frequency as the split-phase signal and which is synchronous with the split-phase signal to be detected, an amplifier having an input and an output, means for periodically setting said amplifier to a fixed reference level comprising a capacitor and a switch, said switch having a first contact coupled to said input of said amplifier, a second contact coupled to said amplifier output, and a control input means coupled to the clock pulse input terminal for switching the switch per clock pulse

to cause the amplifier to supply an output signal which is dependent upon the sign of the difference of two successive signal values occurring in each bit of the split-phase signal, a bistable element having an input coupled to the amplifier



output, and a trigger input means coupled to the clock pulse input terminal for setting and resetting per clock pulse the bistable element in accordance with the output signal supplied by the amplifier, said capacitor being coupled between the signal input terminal and the input of the amplifier.

3,919,653

AUTOMATIC FREQUENCY CORRECTOR FOR DIFFERENTIAL PHASE DEMODULATOR

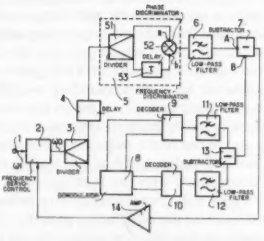
Bernard Le Mouel, La Roche Derrien, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel, France

Filed Apr. 22, 1974, Ser. No. 463,148

Claims priority, application France, Apr. 20, 1973, 73.14506

Int. Cl.[2] H04L *27/22*; H03D *3/18*

U.S. Cl. 329—104 **4 Claims**



1. An automatic frequency corrector for a frequency servo-controller for frequency transposition in a demodulator of a wave modulated by differential phase, comprising a phase discriminator receiving on one input said modulated wave and on a second input the same modulated wave delayed by a time τ, said phase discriminator providing at its output a first bipolar signal, a demodulator receiving said modulated wave, a first decoder connected to said demodulator for providing binary signals corresponding to the positive portions of said bipolar signal, a second decoder connected to said demodulator providing binary signals corresponding to the negative portions of said bipolar signal, a first subtractor responsive to the outputs of said first and second decoders for providing a second bipolar signal, a second subtractor connected to receive said first and second bipolar signals, and means for connecting the output of said second subtractor in control of said frequency servo-controller.

3,919,654

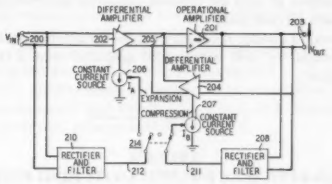
SYLLABIC COMPANDOR

Rouben Toumani, Flanders, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 14, 1974, Ser. No. 497,136

Int. Cl.[2] H03G *3/30*

U.S. Cl. 330—29 **12 Claims**



8. A compressor comprising:

an input signal terminal,

an operational amplifier,

a constant gain feed-forward amplifier connected between the input signal terminal and the input of the operational amplifier,

a feedback amplifier connected between the output and input of the operational amplifier, said feed-forward and feedback amplifiers providing compensating variations of gain with temperature, and

means for controlling the gain of the feedback amplifier in proportion to the amplitude of the alternating current signal at the output of the operational amplifier according to the formula

$$g = kV_o$$

where g is the gain of said feedback amplifier, V_o is the output voltage from said operational amplifier, and k is a constant.

3,919,655

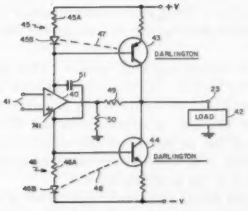
HIGH POWER OPERATIONAL AMPLIFIER

Richard Eugene Crandall, Cambridge, Mass., assignor to Electronics Research Group, Inc., Arlington, Mass.

Filed Dec. 26, 1973, Ser. No. 428,212

Int. Cl.[2] H03F *3/68*

U.S. Cl. 330—30 D **6 Claims**



1. An amplifier circuit comprising

a differential amplifier device responsive to an input signal for supplying amplified output signals;

means for supplying said device with power from positive and negative voltage sources;

a complementary pair of Darlington output transistor means the emitters of which are connected to said voltage sources, the collectors of which are connected to each other and to the output of said circuit and the bases of which are connected to power inputs of said differential amplifier device;

network means for biasing each of said output transistor means, each biasing network means including

diode means; and

resistance means in series with said diode means;

means for providing a thermal contact between each of said diode means and its associated output transistor means; and

a negative feedback network for controlling the frequency roll-off response characteristics of said circuit, said feedback network including

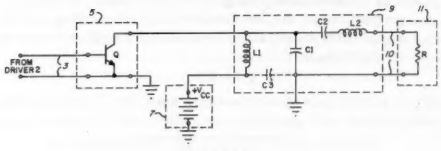
a first divider resistance means connected between the output of said differential amplifier and the output of said circuit; and

a second divider resistance means connected between the output of said differential amplifier and a reference point.

3,919,656
HIGH-EFFICIENCY TUNED SWITCHING POWER AMPLIFIER

Nathan O. Sokal, and Alan D. Sokal, both of 4 Tyler Road, Lexington, Mass. 02173

Filed Apr. 23, 1973, Ser. No. 353,588
Int. Cl.² H03F 1/14
U.S. Cl. 330—51 **10 Claims**



1. In apparatus of the tuned switching type for the high-efficiency generation of alternating-current power, having

A. an active device switch having a low-impedance on state and a high-impedance off state,

B. driver means for causing the switch to commute periodically between the two states,

C. a load network having an input port and an output port, said input port being connected in series with the switch,

D. a load coupled to the output port of the load network, and

E. means for supplying D.C. power to the series combination of the switch and the load network input port, the aforementioned elements being connected such that an inductive element is disposed in the D.C. path which extends to the switch from the means for supplying the D.C. power, and wherein the subcombination of the load network and the load includes

F. A damped resonant circuit, operative at least while the switch is in the off state, in which the damping is effected at least in part by the resistance of the load, said damped resonant circuit including

1. at least one capacitive element whose capacitive reactance at the operating frequency is appreciable, and

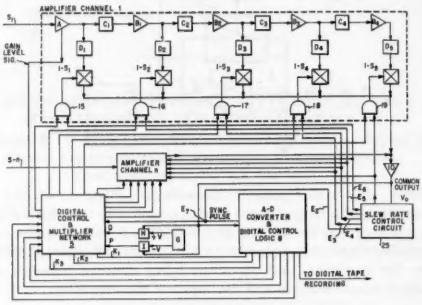
2. at least one inductive element whose inductive susceptance at the operating frequency is appreciable, the improvement wherein

the values of the elements in the subcombination of the load and the load network are such that the voltage across the switch is substantially zero at the end of the off state, the voltage across the switch is substantially zero during the time the switch is in transition from the off state to the on state, and the time derivative of the voltage across the switch is substantially zero at the end of the off state.

3,919,657
WIDE DYNAMIC RANGE AMPLIFIER SYSTEM WITH SLEW RATE CONTROL

Donald L. Howlett; Ernest E. Godsey, and Carl R. Martin, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 415,022
Int. Cl.² H03F 1/14; H03K 13/02
U.S. Cl. 330—51 **4 Claims**



1. A wide dynamic range automatic high-speed gain ranging amplifier system comprising a plurality of amplifier stages, each stage having a predetermined gain, a respective input circuit and a respective output circuit, the amplifiers being coupled in cascade relationship whereby the respective output circuit of each amplifier stage, except a last amplifier stage, is coupled to the respective input circuit of the next following amplifier stage of the cascade relationship; a common output circuit providing an output signal, means for providing reference signals, first comparing means connected to the common output circuit and to the reference signal means for comparing the output signal with predetermined reference signals and providing a first comparision signal corresponding thereto, the improvement comprising a plurality of switches, each switch connecting an output circuit of a corresponding amplifier stage to the common output circuit and being responsive to a pulse to pass an output from the corresponding amplifier stage to the common output circuit which provides the passed output as the output signal, a plurality of AND gates, each AND gate being connected to a corresponding switch and controlled by a control signal to pass a pulse to the corresponding switch or to block a pulse, multiplexing means connected to the AND gates and to the first comparing means for providing sampling and holding pulses each multiplexing cycle to the AND gates in accordance with the first comparison signal so that the AND gates are controlled by the pulses, and the control signals to control the switches to pass the outputs from the amplifier stages to the common output circuit in sequence until the output signal exceeds a reference signal, at which time the amplifier stage output, which caused the output signal to exceed the reference signal, is passed to the common output circuit for the remainder of the multiplexing cycle, or when none of the outputs from the amplifier stages causes the output signal to exceed a reference signal, the output from the last amplifier stage is passed to the common output circuit for the remainder of the multiplexing cycle, unless during the multiplexing cycle the changing output signal exceeds a predetermined maximum allowable slew rate or a predetermined maximum allowable instantaneous level; means connected to the common output circuit for providing a signal corresponding to the slew rate of the output signal in accordance with the output signal; means for providing a signal corresponding to the predetermined maximum allowable slew rate for the output signal; second comparing means connected to the slew rate signal means and to maximum allowable slew rate signal means for comparing the slew rate signal with the maximum allowable slew rate signal and providing a second comparison

signal corresponding thereto, means for providing a signal corresponding to a predetermined maximum allowable instantaneous level for the output signal, third comparing means connected to the common output circuit and to the maximum allowable instantaneous level signal for comparing the output signal with the maximum allowable instantaneous level signal and providing a third comparison signal corresponding thereto; and control signal means connected to the AND gates and to the second and third comparing means for providing a different control signal to each AND gate in accordance with the second and third comparison signals so that the AND gates are individual enabled in sequence to pass an applied pulse unless the slew rate of the output signal exceeds the maximum allowable slew rate or unless the instantaneous level of the output signal exceeds the maximum allowable instantaneous level at which time the next preceding AND gate is enabled for the remainder of the multiplexing cycle; said control signal means includes bi-directional counting means, means for providing counting pulses to the counting means, means connected to the counting means and to the second and third comparing means for controlling the counting means to count the counting pulses in one direction when the amplitude of the output signal does not exceed the amplitude of the maximum allowable instantaneous level signal and the slew rate of the output signal does not exceed its maximum allowable slew rate, to count the counting pulses in an opposite direction when the slew rate of the output signal exceeds the maximum allowable slew rate, and not to count the counting pulses when the amplitude of the output signal exceeds the maximum allowable instantaneous level signal and the slew rate of the output signal does not exceed the maximum allowable slew rate; and means connected to the counting means for decoding the count in the counting means to provide the control signals.

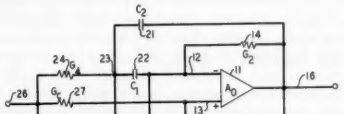
3,919,658
ACTIVE RC FILTER CIRCUIT

Joseph John Friend, Freehold Twp., Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 75,456, Sept. 25, 1970, abandoned. This application May 9, 1972, Ser. No. 251,805

Int. Cl.² H03F *3/45*

U.S. Cl. 330—69 **10 Claims**



1. An RC filter circuit (FIG. 1) which utilizes a single amplifier to provide an output signal, between an output terminal and a reference terminal having fixed potential, which is a second order transformation of an input signal applied between an input terminal and said reference terminal, said filter circuit comprising:

a single amplifier having first and second input terminals and having a single output terminal, said single output terminal common with said filter output terminal;

a first resistor connected to said amplifier first input terminal and to said filter output terminal;

a second resistor connected to said amplifier second input terminal and to said filter output terminal;

a circuit branch comprising the serial connection of a third resistor and a first capacitor, the resistor terminal of said circuit branch connected to said filter input terminal and the capacitor terminal of said circuit branch connected to said amplifier first input terminal;

a second capacitor connected to said circuit branch, intermediate said third resistor and said first capacitor, and to said filter output terminal;

a fourth resistor connected to said filter input terminal and to said amplifier first input terminal;

a fifth resistor connected to said filter input terminal and to said amplifier second input terminal;

a sixth resistor connected to said amplifier first input terminal and to said reference terminal;

a seventh resistor connected to said amplifier second input terminal and to said reference terminal;

and an eighth resistor connected to said circuit branch, intermediate said third resistor and said first capacitor, and to said reference terminal.

3,919,659
DEVICE FOR AMPLIFYING THE ALTERNATING COMPONENT OF A VARIABLE SIGNAL HAVING A CONTINUOUS COMPONENT

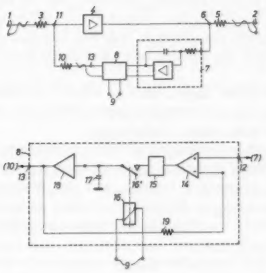
Gerard Eugene Baillet, Choisy-le-Roi, France, assignor to Societe Anonyme de Telecommunications, France

Filed July 20, 1973, Ser. No. 380,973

Claims priority, application France, July 26, 1972, 72.26886

Int. Cl.² H03F *1/36*

U.S. Cl. 330—86 **1 Claim**



1. An arrangement for amplifying the alternating component of a variable signal having a continuous component, comprising amplifying means with input connected to the source of said signal; integrating means with input connected to the output of said amplifying means; and memory means with unit gain connected in series with the output of said integrating means, the output of said memory means being connected to the input of said amplifying means, said memory means having control means for applying the instantaneous output of said integrating means to the input of said amplifying means when in the inoperative state, said control means being actuated in the operative state for applying to the input of said amplifying means the output of said integrating means and held in memory by said memory means at the instant that said control means is actuated, said output of said integrating and held in memory by said memory means comprising the mean value of said signal, said memory comprising a high gain differential amplifier with input connected to the loaded output of said integrating means, a phase corrector connected to the output of said differential amplifier, a relay with normally open contact connected to the output of said phase corrector, the coil of said relay being connected to said control means, an amplifier with unit gain and with high input impedance connected to said contact of said relay, resistor means between the output of said amplifier with unit gain and the other input of said differential amplifier, and a memory capacitor connected to the input of said amplifier with unit gain, said amplifier with unit gain comprising a field effect transistor

followed by an auxiliary transistor, said two transistors being connected in common-collector circuit.

3,919,660

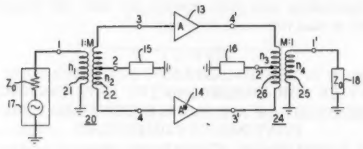
AMPLIFIERS WITH IMPEDANCE-MATCHED INPUTS AND OUTPUTS

Henry Richard Beurrier, Chester Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1971, Ser. No. 204,865

Int. Cl.² H03F *1/00*

U.S. Cl. 330—185 **7 Claims**



1. An amplifier for coupling a signal source to a load comprising:

an input autotransformer and an output autotransformer;

a first tap along said input autotransformer for dividing said input transformer into two unequal portions;

said first tap constituting the input port of said amplifier;

a second tap along said output autotransformer for dividing said output transformer into two unequal portions;

said second tap constituting the output port of said amplifier;

a pair of active stages, each of which is connected between a different end of said input transformer and a different end of said output transformer;

one of said stages having an input impedance that is at least an order of magnitude greater than the net source impedance connected thereto, and the other of said stages having an input impedance that is at least an order of magnitude less than the net source impedance connected thereto;

one of said stages having an output impedance that is at least an order of magnitude greater than the net load impedance connected thereto, and the other of said stages having an output impedance that is at least an order of magnitude less than the net load impedance connected thereto;

an input and output matching impedances connected across at least a portion of said input and output autotransformers, respectively.

3,919,661

ELECTRONIC MONITORING SYSTEM WITH DELAYED ACTIVATION

Robert Buck, Kirchbuhlweg 128, 7995 Neukirch, Germany

Filed Nov. 13, 1974, Ser. No. 523,516

Claims priority, application Germany, Nov. 13, 1973, 2356490

Int. Cl.² H01H *36/00*; H03B *5/12*

U.S. Cl. 331—65 **10 Claims**

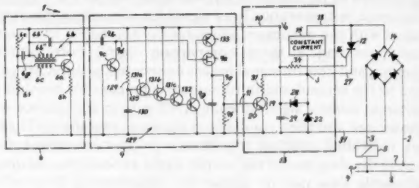
1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means including a sensing stage and an amplifier stage coupled thereto;

a supply circuit including a source of direct current and a current-responsive load;

electronic switch means in circuit with said load controlled by said detector means for modifying the flow of current through said load in response to changes in said output signal;

conductor means leading from said supply circuit to said detector means for energizing same; and



delay means inserted between said conductor means and said amplifier stage for retarding the operation thereof upon activation of said supply circuit until said sensing stage has reached an operative condition, thereby preventing premature actuation of said switch means.

3,919,662

GAS DYNAMIC LASER DEVICE

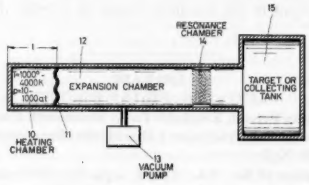
Gunthard Born, Taufkirchen, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Nov. 27, 1973, Ser. No. 419,395

Claims priority, application Germany, Nov. 29, 1972, 2258325

Int. Cl.² H01S *3/03*

U.S. Cl. 331—94.5 G **6 Claims**



1. A gas dynamic laser device comprising a heating chamber for producing heated CO-gas, and a resonance chamber, an expansion chamber interconnecting said heating chamber and said resonance chamber, evacuating means operatively connected to said expansion chamber for initially evacuating said expansion chamber, pressure recovering means operatively connected to said resonance chamber, and rapid release means located directly between said heating chamber and said expansion chamber, whereby in said initially evacuated expansion chamber a rarefaction wave is produced, said rarefaction wave producing a cooling rate sufficient to cause an inversion for deriving laser energy from said resonance chamber.

3,919,663

METHOD AND APPARATUS FOR ALIGNING LASER REFLECTIVE SURFACES

Antonio B. Caruolo, Vernon; Jack W. Davis, East Hartford, and Allen P. Walch, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 23, 1974, Ser. No. 472,932

Int. Cl.² H01S *3/086*

U.S. Cl. 331—94.5 C **17 Claims**

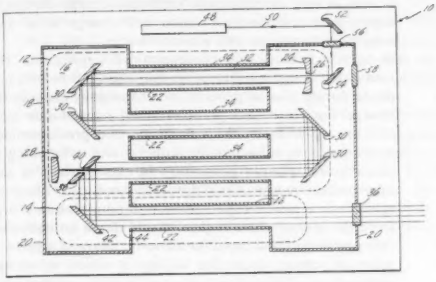
1. Method of aligning with a visible beam the reflective surfaces forming a laser having a resonator region including an optical axis, comprising the steps of:

providing a beam of alignment radiation from an external source;

directing the beam along the optical axis of the resonator;

injecting the beam into the resonator through an aperture in a first end mirror;

aligning a second end mirror such that the center of the alignment beam reflects to the center of the first end mirror; and



aligning the first end mirror such that the center of the alignment beam reflects to the center of the second end mirror.

3,919,664

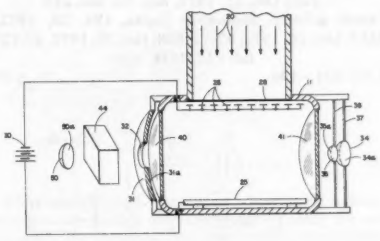
OPTICAL OSCILLATOR-AMPLIFIER LASER CONFIGURATION

Gary Lee McAllister, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 325,939, Jan. 22, 1973, abandoned. This application June 27, 1974, Ser. No. 483,687

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 C **6 Claims**



1. In a laser having an envelope,

means for initiating lasing action within said envelope,

an optical oscillator for establishing unstable resonant oscillation of the lased energy, said oscillator comprising a first pair of mirrors placed opposite each other, the entire reflective surface of one of said mirrors being convex, a portion of the lased energy being reflected back and forth between said mirrors and a portion of the lased energy being diffracted by said convex mirror outside the reflection area of the other of said mirrors, at least one of said first pair of mirrors being mounted outside the laser envelope, and

an amplifier region defined by a second pair of oppositely placed mirrors, one of the mirrors of said second pair having a reflective surface positioned to receive the energy diffracted outside the reflection area of the other of said oscillator mirrors, lased energy being reflected from said one mirror of said second pair to the other mirror of the second pair, back to said one mirror of said second pair and thence coupled outside the optical system.

3,919,665

LASER WITH TRANSVERSE MODE AND FREQUENCY SELECTION

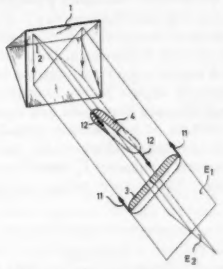
Werner Schmidt, Aalen, Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Germany

Filed July 2, 1974, Ser. No. 485,288

Claims priority, application Germany, July 12, 1973, 2335389; Feb. 14, 1973, 2307123

Int. Cl.² H01S *3/086*

U.S. Cl. 331—94.5 C **6 Claims**



1. A laser assembly comprising a laser cell having an optical axis, a roof prism reflector spaced axially from one end of said cell, said roof prism having an apex intersecting said optical axis, a second reflector spaced axially from a second end of said cell, and a Fabry-Perot etalon located between said two reflectors and tiltable about a tilt axis intersecting said optical axis, said etalon being characterized by the novel feature that the tilt axis of said etalon is at an angle of 45° to a plane containing said optical axis and the apex of said roof prism.

3,919,666

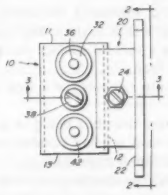
SOLID STATE MICROWAVE CAVITY OSCILLATOR OPERATING BELOW CAVITY CUTOFF FREQUENCY

Ronald Sheldon Posner, Brookline, and Richard Marion Walker, Chestnut Hill, both of Mass., assignors to Microwave Associates, Inc., Burlington, Mass.

Filed Nov. 26, 1974, Ser. No. 527,255

Int. Cl.² H03B *7/14*

U.S. Cl. 331—96 **18 Claims**



1. An electronic oscillator for providing electromagnetic wave energy at microwave frequencies, comprising a section of transmission line having a longitudinal axis, an electron discharge device which is capable of generating such energy in a range of frequencies including a fundamental frequency f_0 which is below the cut-off frequency of said transmission line, and a harmonic frequency of f_0 which propagates in a single mode in said transmission line, means coupling said device to a first region in said transmission line section, tuning means in a second region of the transmission line section spaced a known distance along said axis from said first region for tuning a portion of said section including said first and second regions to resonate substantially as a half-wave cavity to said fundamental frequency f_0, means selected from one or both of (a) means to suppress generation of said harmonic frequency and (b) means to establish in said line a standing

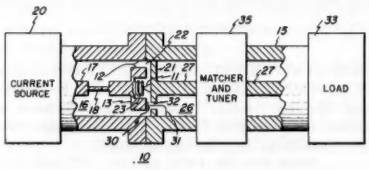
wave of said harmonic frequency having a null in the vicinity of a peak of the fundamental frequency wave, and output means to extract energy at said fundamental frequency f_0 from said portion of said transmission line section, for supplying said fundamental frequency energy substantially free of said harmonic energy to a receiver therefor.

15. An electronic oscillator for providing electromagnetic wave energy at microwave frequencies, comprising a section of transmission line having a longitudinal axis, an electron discharge device which is capable of generating such energy in a range of frequencies including a fundamental frequency f_0 which is below the cut-off frequency f_c of said transmission line, and a harmonic frequency nf_0 of f_0 which propagates in a single mode in said transmission line, means coupling said device to a first region in said transmission line section, tuning means in a second region of the transmission line section spaced a known distance along said axis from said first region for tuning a portion of said section including said first and second regions to resonate substantially as a half-wave cavity to said fundamental frequency f_0, and means to extract from said transmission line section energy at said harmonic frequency.

3,919,667
AVALANCHE DIODE OSCILLATOR

Se Puan Yu, and Wirojana Tantraporn, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 399,313, Sept. 21, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,691
Int. Cl.² H03B 9/12
U.S. Cl. 331—96 **8 Claims**



1. In combination,

an electromagnetic resonator including a first conductive member having a first surface and a second conductive member having a second surface in opposed relationship to said first surface,

said resonator being resonant at a first predetermined frequency,

said first conductive member being of a size and spaced in relationship to said second conductive member to provide a predetermined capacitance,

an avalanche diode comprising a body of semiconductor material including a pair of electrodes secured thereto and an intermediate region of relatively moderate conductivity included therein, one of said electrodes connected to said first conductive member and the other of said electrodes connected to said second conductive member in the low field-high current region of said resonator,

a source of charging current connected in circuit with said predetermined capacitance to charge said predetermined capacitance to a voltage at which said intermediate region is depleted of majority carriers and exceeds the voltage at which substantial avalanche multiplication of conduction carriers occurs in said intermediate region,

said current source being constituted to provide current flow to said predetermined capacitance which causes the voltage across said predetermined capaictance to continue to rise after initiation of substantial avalanche multiplication in said diode to a value at which an avalanche shock front occurs in and traverses said intermediate region to generate an electron-hole plasma therein,

said predetermined capacitance having a value in relation to the voltage at which substantial avalanche multiplication occurs in said diode to hold sufficient charge therein to supply said intermediate region with charge to fill said intermediate region with plasma charge,

said current source, said predetermined capacitance and said diode being constituted so that charge flow into said diode during plasma generation substantially exceeds the charge flow into said predetermined capacitance from said source whereby the voltage on said predetermined capacitance is substantially reduced and avlanching of carriers and plasma generation is extinguished in said intermediate region of said diode, said reduced voltage on said predetermined capacitance sweeping plasma charge from the intermediate region of said diode and allowing said predetermined capacitance to be charged again to a value of voltage above the voltage at which substantial avalanche multiplication occurs to initiate another cycle of operation,

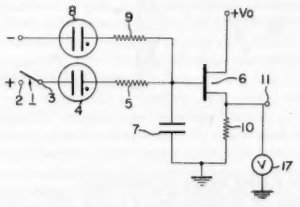
means for setting the rate of charging of said capacitance from said source to preset the frequency of said cycle of operation of a submultiple of said predetermined frequency of said resonator whereby a harmonic component of the pulses of current flowing in said diode due to said cycle of operation excites said resonator to provide a voltage of said predetermined frequency across said capacitance in additive relationship to the voltage produced thereacross by said charging source,

means coupled to said resonator for deriving an output.

3,919,668
DEVICE FOR GENERATING VARIABLE VOLTAGE

Shunji Minami, Moriguchi, and Shunzo Oka, Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1973, Ser. No. 406,239
Claims priority, application Japan, Oct. 20, 1972, 47-105417; Oct. 20, 1972, 47-121608; Oct. 20, 1972, 47-121612
Int. Cl.² H03K 4/08
U.S. Cl. 331—130 **5 Claims**



1. A device for generating a variable output voltage comprising:

a. a single-pole single-throw normally open switch having a first contact connected to an input voltage,

b. an input resistor and a first neon bulb,

c. an MOS field-effect transistor having a gate connected through said input resistor and first neon bulb to a second contact of said single-pole single-throw switch, said switch providing a means for selectively interrupting current flow through said input resistor,

d. a control resistor,

e. a second neon bulb connected in series with said control resistor, the gate of said MOS field-effect transistor being connected to a bias voltage having a potential opposite in polarity to said input voltage through said seriesconnected second neon bulb and control resistor,

f. a non-polarized capacitor connecting the gate of said MOS field-effect transistor to ground,

g. an output resistor connecting the source of said MOS field-effect transistor to ground,

h. said input voltage, said switch, said first neon bulb and said input transistor comprising means for gradually charging said capacitor from said input voltage to a selected potential, whereby the voltage across said output resistor gradually increases, and

i. said second neon bulb and control resistor comprise means responsive to the predetermined potential across said capacitor for rapidly discharging said capacitor, whereby when the voltage across said second neon tube reaches its ionization potential, said capacitor is discharged until the voltage across said second neon tube reaches its deionization potential, thereby rapidly reducing the voltage across said output resistor.

3,919,669

SURFACE WAVE TRANSDUCER ARRAY AND ACOUSTO-OPTICAL DEFLECTOR SYSTEM OR FREQUENCY-SELECTIVE TRANSMISSION SYSTEM, UTILIZING THE SAME

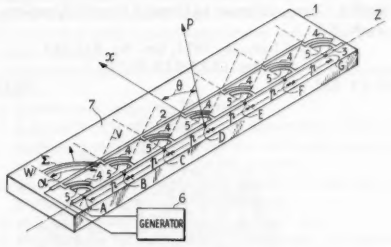
Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 17, 1974, Ser. No. 461,709

Claims priority, application France, Apr. 20, 1973, 73.14632

Int. Cl.² H03H 9/26, 9/34; G02F 1/11, 1/33

U.S. Cl. 333—30 R **14 Claims**



1. Electromechanical transducer array for launching and receiving elastic surface waves propagating along the surface of a piezoelectric substrate, said electromechanical transducer array having an axis lying within said surface, said electromechanical transducer array comprising: a plurality of radiator elements carried by said surface and electrical conductor means for connecting with one another said radiator elements; each of said radiator elements being made of at least two coplanar electrodes separated from one another by a curvilinear radiating gap having a phase center positioned on said axis; said coplanar electrodes forming with said electrical conductor means interdigitated comb shaped structures having curvilinear teeth.

3,919,670

MICROWAVE PHASE SHIFTER

Gerald I. Klein, Westbury, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1974, Ser. No. 432,373

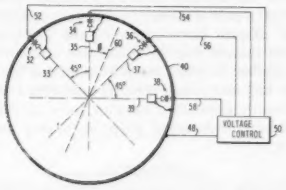
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H03H 7/30; H01P 1/18, 9/00

U.S. Cl. 333—31 A **14 Claims**

1. A microwave phase shifter, comprising in combination: a section of circular waveguide adapted to propagate circularly polarized waves therein;

at least four electrically controlled variable capacitance means, adapted to respectively operate as shunt susceptances, in said waveguide section being located at substantially the same longitudinal position intermediate the central axis and the inner wall surface of the waveguide and further being spaced substantially 45° apart in a plane transverse to the central axis; and



electrical circuit means coupling respective mutually synchronized control signals to said at least four variable capacitance means for selectively varying the capacitance value thereof and providing a varying resultant shunt susceptance therefrom which generates an effective rotatable obstacle plane for said circularly polarized waves, thereby imparting a phase shift thereto which is a function of the angle of said obstacle plane relative to a fixed reference.

3,919,671

DIGITAL FILTER

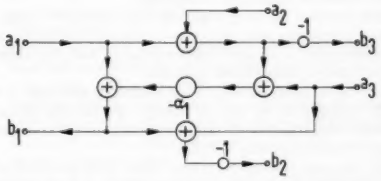
Alfred Fettweis, and Axel Sedlmeyer, both of Bochum, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 19, 1973, Ser. No. 426,090

Claims priority, application Germany, Dec. 22, 1972, 2263087

Int. Cl.² H03H 7/10

U.S. Cl. 333—70 R **9 Claims**



1. A filter with frequency-dependent transmission properties for an electrical analog signal which has been converted to digital form, the filter comprising a basic filter circuit which corresponds to an analog LC circuit for analog signals, said basic filter circuit comprising reactive single port circuit means having transit time for realizing inductive and capactive two-terminal circuit elements of said analog LC circuit, non-reactive circuit means for realizing non-reactive circuit elements of said analog LC circuit, said reactive circuit means and said non-reactive circuit means having respective ports with respective different port impedances in accordance with the parameters of said analog LC circuit, and interface means for interconnecting the reactive and non-reactive circuit means in accordance with the configuration of said analog LC circuit and comprising adaptors for providing impedance matching between the circuit means, each adaptor having a plurality of adaptor ports and comprising an adaptor circuit including adders and multipliers connected with the adaptor ports thereof and determining the respective port impedances of such adaptor ports and such that there is impedance matching at each port of each adaptor to the impedance of the

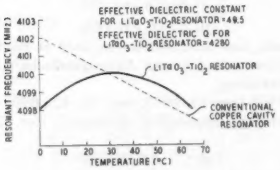
associated connected port, wherein the improvement comprises: a plurality of said adaptors being directly connected, respective pairs of directly connected adaptors each having respective directly connected adaptor ports including respective port input and port output units, the respective port output units of the respective directly connected adaptor ports of each pair of directly connected adaptors being directly connected to the respective port input units of the respective other one of the directly connected adaptor ports, and one adaptor of each pair of directly connected adaptors having at least three adaptor ports including the directly connected adaptor port thereof and the associated adaptor circuit providing decoupling between the port input and the port output unit of the last mentioned directly connected adaptor port, and the directly connected adaptor ports of the respective pairs of directly connected adaptors having matched port impedances.

3,919,672

TEMPERATURE COMPENSATED DIELECTRIC RESONATORS

James Kevin Plourde, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1972, Ser. No. 317,385
Int. Cl.² H01P *1/30, 7/06*
U.S. Cl. 333—82 BT **2 Claims**



1. A dielectric resonator comprising

a first member having a high dielectric constant, a high Q, and a negative rate of change of dielectric constant with temperature over said frequency range, said first member including a paraelectric material;

a second member having a high dielectric constant, a high Q, and a positive rate of change of dielectric constant with temperature over said frequency range, said second member comprising $LiTaO_3$;

said first and second members being arranged to form a composite resonator structure having a high effective dielectric constant, a high effective Q and a rate of change of said effective dielectric constant with temperature which is substantially low over said frequency range, said second member being polarized in a direction parallel to the optical axis thereof.

3,919,673

NONRECIPROCAL ABSORPTION FILTER

Joseph John Kostelnick, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

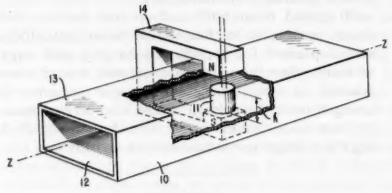
Filed June 5, 1974, Ser. No. 476,696
Int. Cl.² H01P *1/36*
U.S. Cl. 333—24.2 **6 Claims**

1. A nonreciprocal filter including:

a section of waveguide whose cross-sectional dimensions are proportioned to permit the propagation of electromagnetic wave energy over a defined frequency band of interest;

and means for attenuating wave energy within a selected portion of said band of interest for one direction of wave propagation comprising:

an element of gyromagnetic material magnetically biased below gyromagnetic resonance with respect to the frequency band of interest and positioned within said section to produce a region of substantial field intensity differential in said wave energy for opposite directions of wave propagation, and for simultaneously forming a dielectric



resonator that is critically coupled to said wave energy over said selected portion of said band of interest for one direction of propagation while being substantially transparent to said wave energy for the opposite direction of wave propagation;

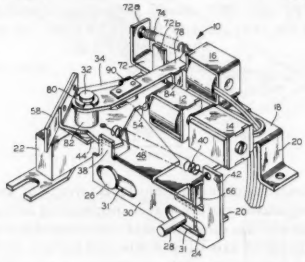
said section of waveguide being substantially free of any other attenuating means.

3,919,674

ACCESSORY APPARATUS FOR TRIPPING AN ELECTRIC CIRCUIT BREAKER

Vincent Paul Acampora, and David Barton Powell, both of Bristol, Conn., assignors to General Electric Company, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,252
Int. Cl.² H01H *83/00*
U.S. Cl. 335—20 **20 Claims**



1. Accessory apparatus for tripping an electric circuit breaker, said apparatus comprising, in combination:

A. a support for mounting attachment to the circuit breaker;

B. first and second members mounted by said support for movements between respective reset and actuated positions;

C. latch means carried by said second member for releasably latching said first member in its reset position while said second member is assuming its reset position;

D. a tension spring connected between said first and second members;

E. tripping means carried by one of said first and second members for movement therewith into tripping engagement with a circuit breaker latch as said one member is propelled to its actuated position by said spring;

F. a trip solenoid mounted on said support and having a plunger acting to move said second member away from its reset position against the bias of said spring and thereby unlatch said first member for movement to its actuated position under the influence of said spring; and

G. reset means acting to return said first member from its actuated position to its reset position,

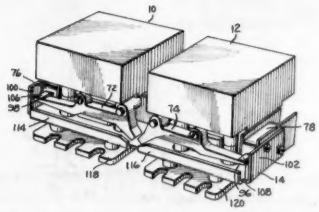
1. said spring pulling said second member back to its reset position as said first member is returned to its reset position to thereby bring said latch means into latching engagement with said first member.

3,919,675

INTERLOCKING ARRANGEMENT FOR A PAIR OF ELECTRICAL CONTACTORS

Thomas Wayne Degenhart, Normal, and Christian De Visser, Clinton, both of Ill., assignors to General Electric Company, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,346
Int. Cl.² H01H *9/26, 47/00*
U.S. Cl. 335—160 **4 Claims**



1. In combination with a first and a second electromagnetic switching device, are interlocked means for preventing simultaneous actuation of said devices, and means for maintaining said devices in a fixed spaced relationship and for supporting said interlock means:

A. each of said electromagnetic switching devices comprising:

a. a stationary magnetic member;

b. a movable magnetic member in juxtaposition with said stationary magnetic member and movable between a de-energized and an energized position;

c. an energizing coil magnetically coupled to said stationary and movable magnetic members;

d. at least one stationary power contact; and

e. at least one movable power contact in juxtaposition with said stationary contact and mechanically coupled to said movable magnetic member; and

B. said interlocking means comprising:

a. first and second rigid arms pivotally mounted to said maintaining and supporting means;

b. a first means mechanically coupling said first arm to said movable magnetic member of said first device for pivotally moving said first arm between a first and a second position in response to movement of said movable magnetic member of said first device between the de-energized and the energized position;

c. a second means mechanically coupling said second arm to said movable magnetic member of said second device for pivotally moving said second arm between a first and a second position in response to movement of said movable magnetic member of said second device between the de-energized and the energized position; and

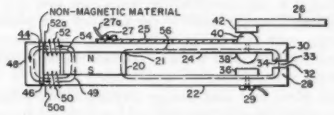
d. first and second electrical switches each having a closed and an open position, said first electrical switch being electrically connected in series with said coil of said second device and mechanically interlocked with a portion of said first arm, said second electrical switch being electrically connected in series with said coil of said first device and mechanically interlocked with a portion of said second arm, whereby when said movable magnetic members of said first and second devices are in the de-energized position, said first and second arms are positioned to maintain said first and second electrical switches in the closed position, when said movable magnetic member of said first device moves to the energized position in response energization of said coil of said first device, said first arm being caused to move from its first to its second position to enable said first electrical switch to open and thereby prevent energization of said coil of said second device, and when said movable magnetic member of said second device moves to the energized position in response to energization of said coil of said second device, said second arm is moved from its first to its second position to enable said second electrical switch to open and thereby prevent energization of said coil of said first device.

3,919,676

PERMANENT-MAGNET TYPE RELAY

Walter V. Bratkowski, McKeesport, and Metro Spewock, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1974, Ser. No. 439,168
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01H *51/27*
U.S. Cl. 335—179 **5 Claims**



1. A permanent magnet type relay including:

a permanent magnet located between a pair of longitudinal ferromagnetic members intermediate the ends of the ferromagnetic members,

a first magnetic path,

said first magnetic path comprising fixed end portions of said ferromagnetic members which extend in one direction from said permanent magnet, a keeper member bridging said fixed end portions to complete the magnetic path, and non-magnetic material interposed between said fixed end portions and said keeper member,

a second magnetic path,

said second magnetic path comprising cantilever end portions of said ferromagnetic members which extend from said permanent magnet in a direction opposite from the extension of fixed first end of said ferromagnetic members, at least one of said cantilever end portions being flexible to move relative to the other of said cantilever end portions,

electrical contact means, operable to produce first and second external circuit conditions,

winding means inductively coupled to at least one of said magnetic paths,

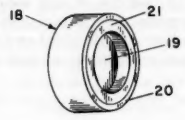
means for energizing said winding means,

reversible current supply means for selectively reversing the flow of current through said winding means to change the relative magnitude of the flux density in said first and second magnetic paths to cause said at least one cantilever end portion to flex, flexing of said cantilever end portion causing said electrical contact means to produce a first external circuit condition when said cantilever end portions are in a position of close physical proximity and causing said electrical contacts to produce a second external circuit conditions when said cantilever end portions are in relatively spaced-apart position.

3,919,677
SUPPORT STRUCTURE FOR A SUPERCONDUCTING MAGNET

Warren C. Young; Roger W. Boom, and Harold A. Peterson, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed July 5, 1974, Ser. No. 485,978
Int. Cl.[2] H01F *7/22*
U.S. Cl. 335—216 **5 Claims**



1. An electrical magnet, comprising:

a. a coil of composite conductor formed of a superconducting material and a normal conducting material and having an outer periphery;

b. a substantially flat plate having two opposite substantially parallel faces and a periphery substantially conforming to the outer periphery of said coil;

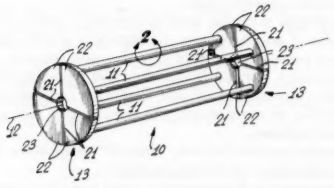
c. a flange affixed to and extending around the periphery of said plate, said flange fitting over and restrainably engaging the outer periphery of said coil with said coil lying in a plane substantially parallel to the faces of said plate, whereby electrical current passing through said composite conductor, when it is maintained at temperatures at which it is superconducting, will cause said coil to exert outward forces parallel to the faces of said plate on said flange, with said flange transmitting such forces to said plate whereby said plate is stressed in two dimensions; and

d. said plate and said flange thereon being formed of a structural material capable of carrying such forces exerted by said coil when said composite conductor is maintained at temperatures at which it is superconducting.

3,919,678
MAGNETIC FIELD GENERATION APPARATUS

Alan S. Penfold, Playa Del Rey, Calif., assignor to Telic Corporation, Santa Monica, Calif.

Filed Apr. 1, 1974, Ser. No. 456,663
Int. Cl.[2] H01F *3/00*
U.S. Cl. 335—296 **17 Claims**



1. For use in a cathode sputtering process in a near-vacuum environment, apparatus for generating a magnetic field of predetermined configuration, comprising:

a plurality of elongated magnetizable elements arranged in a generally symmetrical array about a central axis;

means for applying a magnetomotive force of a desired magnitude and direction to each of said magnetizable elements; and

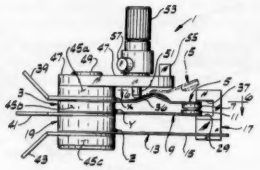
means for connecting corresponding ends of said magnetizable elements to form a cage-like structure substantially longer than the maximum spacing of said elongated magnetizable elements, and to complete a plurality of magnetic flux paths between said magnetizable elements and the magnetic field generated within the structure;

whereby each of said magnetizable elements produces within the structure paths of magnetic flux having both axial and non-axial components with respect to said central axis, and the non-axial components of flux are minimizable by appropriate selection of said magnetizable elements and said means for applying a magnetomotive force to generate non-axial components which substantially cancel each other.

3,919,679
TIME-DELAY SWITCH

Geoffrey W. Kingma, Downsview, Canada, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 21, 1974, Ser. No. 499,382
Int. Cl.[2] H01H *61/02, 63/013, 71/16*
U.S. Cl. 337—107 **13 Claims**



1. A time-delay switch comprising a base, a first flexible switch arm cantilevered from said base and carrying a first contact on the free end thereof, a second flexible switch arm cantilevered from said base and carrying a second contact on the free end thereof engageable and disengageable with the first contact for making and breaking an electrical circuit, thermal actuator means comprising a bimetallic arm cantilevered from said base for flexing toward and away from said switch arms in response to changes in temperature, said first and second switch arms and said bimetallic arm being substantially parallel to and spaced from one another for flexing movements in a common plane and about spaced apart transverse axes for each of said arms lying in a plane substantially perpendicular to said common plane contiguous to said base, means coupling said bimetallic arm and at least one of said switch arms to effect movement of the free end thereof relative to said base and to the other switch arm in response to flexing of said bimetallic arm between a closed position in which said first and second contacts are in engagement with one another for making said electrical circuit and an open position in which the contacts are clear of one another for breaking said circuit, and self-regulating heating means interposed between the fixed ends of the bimetallic arm and the second switch arm and having opposed current- carrying faces respectively in electrical and thermal contact with the fixed ends of the first switch arm and with the bimetallic arm for heating the latter thereby to cause said bimetallic arm to flex and to thus effect movement of the contacts between their closed and open positions in delayed response to energization of said heater means.

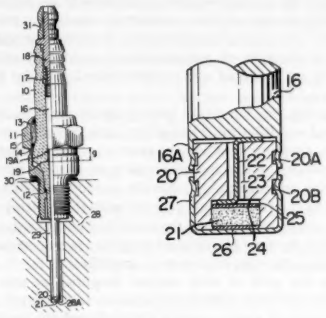
3,919,680
TEMPERATURE DETECTOR HEAD

Sadayasu Ueno, and Yukio Hosho, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed June 25, 1974, Ser. No. 483,043
Claims priority, application Japan, Sept. 14, 1973, 48-103010
Int. Cl.[2] H01C *7/00*
U.S. Cl. 338—28 **4 Claims**

1. A temperature detector head comprising a hollow plug member having means for securing said plug member to a

body for measuring the temperature of the body, a generally tube-like insulator hermetically fitted into said plug member, a metal rod slidably fitted into said tube-like insulator, one end of said metal rod protruding out of said insulator and said plug member, a spring provided against the other end of said metal



rod so as to push said rod in the axial direction toward said one end, and a piece of thermistor provided on said one end of said metal rod, wherein said metal rod and the bore of said tube-like insulator are stepped in diameter so as to prevent said rod from coming off said insulator.

3,919,681

COMBINED VARIABLE RESISTOR ASSEMBLY PROVIDED WITH POSITION INDICATOR MEANS

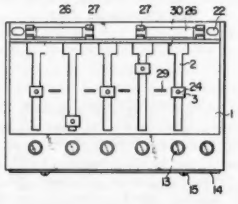
Matsuo Nishioka; Shunzo Oka, both of Hirakata; Akitoshi Miyashita, Suita, and Kazuo Oshima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 26, 1973, Ser. No. 427,735

Claims priority, application Japan, Dec. 28, 1972, 48-4577; Dec. 28, 1972, 48-4578; Dec. 28, 1972, 48-4579; Dec. 28, 1972, 48-4580

Int. Cl. H01c *5/00*

U.S. Cl. 338—119 **9 Claims**



1. A combined variable resistor assembly provided with position indicator means, comprising a panel casing formed with a plurality of parallel slots, rotatable variable resistors corresponding in number to the number of said slots and mounted on said panel casing, slide members slidably engaged in said respective slots, drums each secured to an operable shaft of the associated one of said variable resistors, belts each having one end secured to the associated one of said drums and the other end secured to the associated one of said slide members, a light source, and optical fibers each having one end held in the neiborhood of said light source and the other end connected to each said slide members.

3,919,682

ELECTRICAL RESISTOR WITH A POLYCRYSTALLINE CERAMIC COVER AND A PROCESS FOR ITS MANUFACTURE

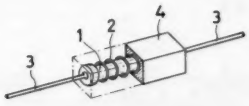
Ubaldo Costa, Milan, Italy, assignor to S.E.C.I. Soc. Elettrotecnica Chimica Italiana S.p.A., Milan, Italy

Filed Sept. 4, 1973, Ser. No. 393,998

Claims priority, application Italy, Sept. 8, 1972, 28983/72

Int. Cl.² H01C *1/034*

U.S. Cl. 338—262 **13 Claims**



1. An electrical resistor comprising a ceramic support, a resistive element on said support, and conductors connected to said resistance element and extending from said support, and an inorganic insulating and protective cover chemically and physically bonded to all the parts constituting the resistor including those portions of said conductors adjacent said support, said cover comprising a polycrystalline ceramic obtained by controlled in situ crystallization of a vitreous material in such a manner as to obtain microcrystals uniformly dispensed and distributed in the vitreous mass.

3,919,683

ULTRASONIC WAVE TRANSMITTING AND RECEIVING APPARATUS

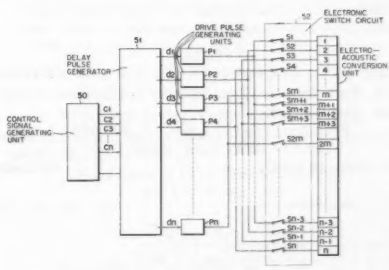
Einoshin Itamura, Tokyo, and Kazuhiro Iinuma, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 13, 1974, Ser. No. 469,504

Claims priority, application Japan, May 21, 1973, 48-55556

Int. Cl.² G01S *9/66*

U.S. Cl. 340—1 R **5 Claims**



1. An ultrasonic wave transmitting and receiving apparatus comprising an ultrasonic wave transmitting device for emitting ultrasonic wave beams being focussed, provided with a control signal generating unit for generating control signals in turn in a circulating manner, a delay pulse signal generating unit for generating a plurality of delay pulse signals in respective prescribed delay times in response to control signals from said control signal generating unit, a plurality of drive signal generating units for generating drive signals in delay times corresponding to those of said delay pulse signals in response to delay pulse signals from said delay pulse signal generating unit, a switching circuit unit having a plurality of electronic switches designed to perform the switching operation by being displaced in turn one by one for every prescribed number of switches so as to supply drive signals from said drive signal generating units to prescribed electro-acoustic conversion elements, respectively; and an ultrasonic wave receiving de-

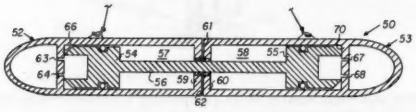
vice for receiving the reflected waves of said ultrasonic wave beams and detecting ultrasonic wave receiving signals via said switching circuit unit and composing said signals through delay means.

3,919,684

UNDERWATER SEISMIC SOURCE AND METHOD

Dale H. Reed, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 4, 1974, Ser. No. 430,641
Int. Cl.² H04B *13/00*
U.S. Cl. 340—8 R **2 Claims**



1. Apparatus for imparting a seismic pulse to a submarine surface of the earth comprising:

a. a first and a second enclosed tubular member supported beneath the surface of a body of water in axially aligned adjacent end-to-end relation, each of said first and second tubular members having a sealed cylindrical bore therein;

b. a pair of pistons slidably movable within said cylindrical bores respectively;

c. a rod extending axially between said first and second tubular members and within said cylindrical bores to interconnect said pair of pistons;

d. air spring means behind said pistons within said cylindrical bores adapted to urge said pistons relative to said cylindrical bores so as to bias said first and second tubular members together; and

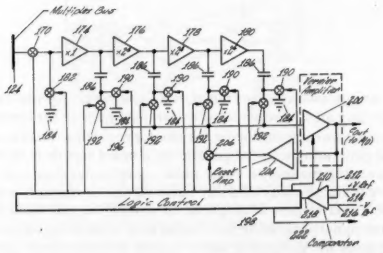
e. explosive gas means within said cylindrical bores in front of said pistons adapted to urge said first and second tubular member apart in opposition to said air spring means so as to rapidly separate the facing ends of said first and second tubular members and create a low pressure condensable vapor bubble therebetween in said body of water.

3,919,685

SEISMIC DATA ACQUISITION SYSTEM AND METHOD

Harry K. Haill, Houston, Tex., assignor to GEO Space Corporation, Houston, Tex.

Filed Nov. 26, 1973, Ser. No. 419,058
Int. Cl.² G01V *1/28*; H03G *3/20*
U.S. Cl. 340—15.5 GC **14 Claims**



12. The method of acquiring seismic data comprising the steps of

detecting seismic energy in the earth and producing in response thereto a plurality of analog signals each having an amplitude which is within a known amplitude range;

multiplexing said analog signals; and

gating said multiplexed analog signal to a controlled gain amplifier capable of amplifying the analog signal with a programmable amplification to produce an output analog signal having an amplitude within a predetermined amplitude range which is less than said known amplitude range;

amplifying said analog signal with at least a first of a plurality of series connected operational amplifiers to produce an amplified analog signal;

controlling transmission of the amplified analog signal within the controlled gain amplifier with an output gating means to one of the operational amplifier next in said series circuit relationship and to a vernier amplifier having a plurality of predetermined gains and capable of being set at one of said predetermined gains by a control signal;

comparing the amplified analog signal from each operational amplifier prior to transmission thereof with a reference signal to produce the control signal to program the amplification required to produce an output analog signal having an amplitude within the predetermined range;

enabling the output gating means with the control signal to control transmission of the amplified analog signal to said one of the next operational amplifier in said series circuit relationship and said vernier amplifier;

setting the gain of said vernier amplifier at one of said predetermined gains in response to said control signal to produce an output analog signal therefrom amplified by at least one of the operational amplifiers and having an amplitude within the predetermined amplitude range;

clamping each operational amplifier in a predetermined sequence, prior to the controlled gain amplifier receiving an analog signal, with the output gating means to a reset amplifier having a feedback network for removing spurious signals from the clamped operational amplifier;

converting the output analog signal to a digital data signal representing the seismic information in the output analog signal;

generating a digital control signal representing the programmed amplification of the analog signal by the controlled gain amplifier in producing the output analog signal having an amplitude within said predetermined amplitude range; and

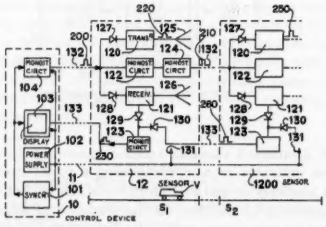
storing the digital data signals and the digital control signals as the acquired seismic data derived from the seismic energy.

3,919,686

ROUTE SURVEILLANCE SYSTEM

Jean-Raymond Narbaits-Jaureguy, and Henri Billottet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 2, 1973, Ser. No. 375,446
Claims priority, application France, July 7, 1972, 72.24750
Int. Cl.² G08G *1/12*
U.S. Cl. 340—24 **9 Claims**



1. A system for surveying traffic along a route, comprising:

a series of sensors fixedly disposed along said route, each of said sensors having an operating range limited to a route section respectively assigned thereto, the route sections assigned to said series of sensors sequentially adjoining one another;

normally inactive monitoring means in each sensor triggerable into an active condition for emitting an output signal in the presence of a vehicle in the assigned route section;

a control post including a source of recurrent start pulses and indicator means for the output signals of said sensors;

a first two-way signal link between said control post and the first sensor in the series for transmitting said start pulses to said monitoring means thereof to trigger same into said active condition and for delivering an output signal therefrom to said indicator means;

a further two-way signal link between each preceding sensor and the immediately following sensor in the series for transmitting trigger pulses to the monitoring means of said immediately following sensor to activate same and for delivering an output signal therefrom to the immediately preceding sensor for retransmission to said indicator means by way of all intervening sensors; and

pulse-generating means in each preceding sensor for producing an outgoing trigger pulse for the immediately succeeding sensor in response to an incoming trigger pulse from said control post in the case of said first sensor and from preceding sensors in all other instances.

3,919,687

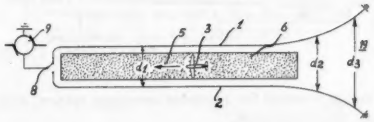
GUIDING SYSTEM FOR LANDING AIRCRAFTS

Tore Gülich, Malmo, and Lennaet Stigmark, Staffanstorp, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 18, 1974, Ser. No. 461,925

Int. Cl.² G08G *5/00*

U.S. Cl. 340—27 NA **4 Claims**



1. In combination with an aircraft for aiding the latter during its landing approach to touch down: electric conductor means arranged in the ground at both sides along the glide path of the landing aircraft, the ends of the conductor means which are intended to be entered first by the landing aircraft converging towards the point of touch down, constant frequency current means operable to convey current to said electric conductor means, a switch alternately connecting the one and the other of the electric conductor means to said current means, the currents in the conductor means generating magnetic fields extending to the altitude of said glide path, a coil system provided in said aircraft, the coil system comprising first coil means for picking up the horizontal component of said magnetic fields and second coil means for picking up the vertical component of said magnetic fields, said coil means being arranged substantially perpendicular with regard to each other and being adapted to have voltages induced therein by said magnetic fields, and indicating means in said aircraft and said indicating means being electrically connected to the coil system to receive the voltages induced, the indicating means giving a presentation of the voltages caused by the magnetic fields of one and the other of the two conductor means, the presentation, when being symmetric with respect to a reference indication indicating that the aircraft flies halfway between the two conductors.

3,919,688

MAXIMUM-SPEED SIGNALLING DEVICE FOR MOTOR VEHICLES

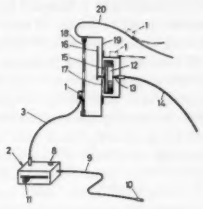
Georges Schick, Renens, Switzerland, assignor to Schick & Cie, Renens, Switzerland

Filed Mar. 13, 1974, Ser. No. 450,678

Claims priority, application Switzerland, Mar. 21, 1973, 4113/73; Mar. 4, 1974, 3011/74

Int. Cl.² B60Q *1/54*

U.S. Cl. 340—62 **10 Claims**



1. An accessory maximum speed signalling device for a motor vehicle including a first housing, a speedometer having a rotatable magnet in said first housing, said magnet producing a rotating magnetic field having field lines which extend outside said first housing, said speedometer including a speed indicating means and means actuating said indicating means in response to said rotating magnetic field, said accessory signalling device comprising:

a. a sensor adapted to be located within the field lines which extend outside said first housing but without said first housing, said sensor being sensitive to variations in the magnetic field lines which extend outside said first housing, said sensor including means for emitting an electric signal representative of the variations, and

b. a second housing, connected to said sensor, said second housing including a speed alarm, a control circuit for receiving the signal emitted by said sensor and actuating said alarm when the signal reaches a predetermined threshold, and setting means for adjusting said threshold.

3,919,689

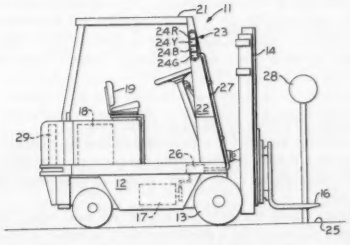
VEHICLE SPEED INDICATOR SYSTEM

James E. Despain, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed June 3, 1974, Ser. No. 475,847

Int. Cl.² B60Q *1/26*

U.S. Cl. 340—62 **3 Claims**



1. In combination with an industrial lift truck vehicle which is to be driven along a predetermined route wherein different maximum safe speeds exist at different portions of said route, a speed-indicating system for said vehicle comprising:

a plurality of electrical lamps each producing a different colored light;

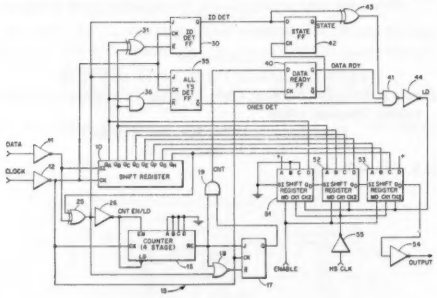
means for attaching said plurality of lamps on said vehicle in position to be observable from viewpoints outside said vehicle;

means for magnetically sensing rotation of a rotary element coupled to the drive system of said vehicle and for producing a DC signal having a magnitude which is a function of the rotary speed of said element, wherein said rotary element of said vehicle is a gear having teeth thereon and which is formed of ferromagnetic material and wherein said means for magnetically sensing rotation of said element comprises a magnet having an end situated adjacent the path of travel of said teeth of said element and having an electrical coil disposed in the magnetic field of said magnet to produce electrical pulses having a repetition rate which is a function of the speed of said element, said coil being coupled to means for averaging said electrical pulses to produce said DC signal, circuit means for detecting when said DC signal reaches each of a plurality of different magnitude ranges and for energizing different colored ones of said lamps when said DC signal is within different ones of said magnitude ranges each of said DC signal magnitude ranges having an end point corresponding to a separate one of said maximum safe speeds to light a different one of said lamps as speed rises above each of said maximum safe speeds, and indicator means disposed at least at intervals along said predetermined route of travel and being colored to indicate the maximum safe speed range of the adjacent portion of said route, the color of said indicator means corresponding to the color of the one of said lamps which is lighted as said lift truck reaches said maximum safe speed range.

3,919,690
DIGITAL RECEIVING APPARATUS

Robert G. Field, Millis, and Donn A. Wahl, Dedham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 27, 1975, Ser. No. 553,466
Int. Cl.² G06F *11/00*; G08C *25/00*
U.S. Cl. 340—146.1 BA **6 Claims**



1. Digital receiving apparatus comprising

input storage means for receiving and storing digital words; detection means for detecting the presence or absence of particular digital code words stored in said input storage means;

counting means for determining when said input storage means has received a predetermined number of identical digital words in succession;

control means coupled to said detection means and to said counting means and having two operating states; said control means being operable in a first operating state in response to a determination that said predetermined number of identical particular digital code words have been received by said input storage means; and being operable in the second operating state in response to a determination that said predetermined number of identical digital words other than said particular digital code words have been received by said input storage means; said control means being operable to produce an indication in response to a determination that said predetermined number of identical particular digital code words have been received by said input storage means when in said second operating state, and being operable to produce an indication in response to a determination that said predetermined number of identical digital words other than said particular digital code words have been received by said input storage means when in said first operating state;

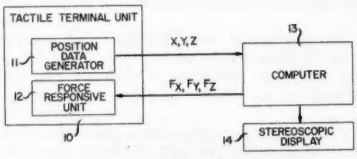
output storage means coupled to said input storage means and to said control means for receiving and storing a digital word stored in said input storage means in response to an indication from said control means; and

readout means for applying a readout signal to said output storage means to read out the digital word stored in said output storage means.

3,919,691
TACTILE MAN-MACHINE COMMUNICATION SYSTEM

A. Michael Noll, Passaic Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill

Filed May 26, 1971, Ser. No. 147,052
Int. Cl.² G06F *3/02*
U.S. Cl. 340—172.5 **10 Claims**



1. A tactile terminal for a graphic computer system, which comprises, in combination,

a data generator for delivering to a computer coordinate signals in a three-dimensional coordinate system which define the position of a point in space,

means for comparing the position defined by said coordinate signals to the position of a prescribed point within said three-dimensional coordinate system stored within said computer to produce signals related to any difference therebetween, and

responsive means supplied with said related signals from said computer to control said data generator to produce coordinate signals which correspond substantially to said prescribed point.

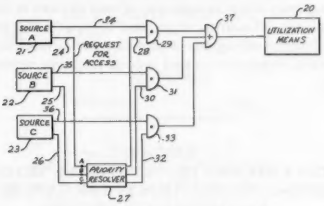
3,919,692
FAST INHIBIT GATE WITH APPLICATIONS

Reinhard K. Kronies, Glendora, and John R. Coupland, El-Monte, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 124,415, March 15, 1971, Pat. No. 3,753,014. This application Dec. 1, 1972, Ser. No. 311,275
Int. Cl.² G06F *13/00*; H03K *19/00*
U.S. Cl. 340—172.5 **7 Claims**

1. In combination, a plurality of sources of binary coded data; means utilizing the binary coded data from the sources; a two input AND gate connected between each source and the utilization means; and a priority resolver, each source having an output connected to the priority resolver for transmitting a request for access to the utilization means through the priority resolver, the priority resolver having an output for each

AND gate associated with each source for enabling the AND gate to transmit the data from a source to the utilization means with the priority resolver including means for coupling the request for access signal from the highest priority source directly to the AND gate associated with that source, said priority resolver including electronic circuits having two input terminals and at least one output terminal, which circuit functions as an RS flip-flop for a first and a second combination of binary input signals and as a combinational logic element for



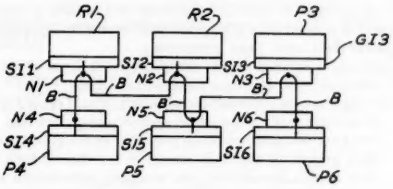
a third combination of binary input signals, connected in the path of each request for access signal for all lower priority sources with the request for access signal being applied to one input terminal and the complement of the request for access signal being applied to the other input terminal, and means for additionally coupling the request for access signal from each higher priority source to the one input terminal of the electronic circuit to which the complement of the request for access signal of the associated source is connected.

3,919,693

ASSOCIATIVE INTERFACE FOR SINGLE BUS COMMUNICATION SYSTEM

George A. Anderson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 26, 1974, Ser. No. 492,264
Int. Cl.² G06F *15/16*
U.S. Cl. 340—172.5 **8 Claims**



1. In a data processing system including a first receiving device, a second receiving device and a sending device interconnected by a bus, improved apparatus for transmitting data from the sending device to the first and second receiving devices comprising:

transmitting means in the sending device for transmitting on the bus during a first time period a genus identification signal generic to the first and second receiving devices followed by a first data signal so that the first data signal can be received by both the first and second receiving devices, for transmitting on the bus during a second time period the genus identification signal and a first species identification signal specific to the first receiving device followed by a second data signal so that the second data signal can be received only by the first receiving device, and for transmitting on the bus during a third time period the genus identification signal and a second species identification signal specific to the second receiving device followed by a third data signal so that the third data signal can be received only by the second receiving device;

first data receiving means in the first receiving device responsive to the genus identification signal on the bus and the absence of the first and second species identification signals on the bus for accepting the first data signal from the bus, responsive to the combination of the genus and first species identification signals on the bus for accepting the second data signal from the bus and responsive to the combination of the genus and second species identification signals on the bus for rejecting the third data signal on the bus; and

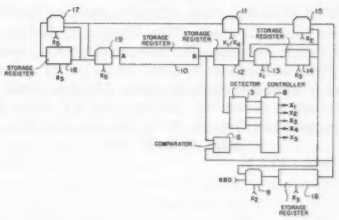
second data receiving means in the second receiving device responsive to the genus identification signal on the bus and the absence of the first and second species identification signals on the bus for accepting the first data signal from the bus, responsive to the combination of the genus and the first species identification signals on the bus for rejecting the second data signal on the bus and responsive to the combination of the genus and second species identification signals on the bus for accepting the third data signal from the bus, whereby the sending device can transmit data to the first and second receiving devices by transmitting a genus identification signal which is used as part of the identification signals required to transmit data to the first or second receiving devices individually.

3,919,694

CIRCULATING SHIFT REGISTER MEMORY HAVING EDITING AND SUBROUTINING CAPABILITY

Chung C. Tung, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 10, 1974, Ser. No. 468,958
Int. Cl.² G11C *21/00, 9/02*; **G06F** *9/16*
U.S. Cl. 340—172.5 **21 Claims**



1. A circulating shift register memory for storing coded informational words, comprising:

a plurality of storage registers, each having an input port for receiving and an output port for transmitting informational words, coupled in series to form a circulation path for circulating informational words therein;

circulation means for causing circulation of informational words in the circulation path, to maintain the storage of the informational words in the storage registers;

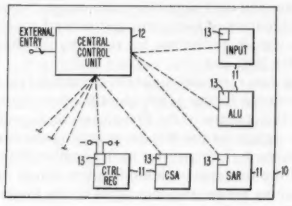
detecting means having output ports and an input port coupled to one of the storage registers for producing a control signal at one of the output ports in response to detection of uniquely coded informational words at the input port as they circulate through said storage register; and

a plurality of switching means, each having input and output ports, through which the storage registers are coupled, one of the input ports also being coupled to one of the output ports of the detecting means for receiving a control signal to selectively couple at least one of the storage registers to the circulation path or decouple one of the storage registers from the circulation path in response thereto when the storage register contains an informational word.

3,919,695
ASYNCHRONOUS CLOCKING APPARATUS

David N. Gooding, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,555
Int. Cl.[2] G06F *15/16*
U.S. Cl. 340—172.5 16 Claims

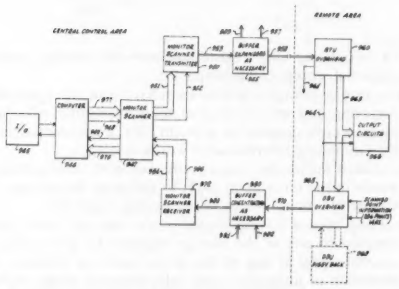


1. Clocking apparatus for controlling circuit timing in a multi-unit data processing system comprising:
- a plurality of data processing units, each having therein cyclic logic circuits;
- a clocking circuit in each of said units producing in response to a start signal a predetermined independent series of timing signals to constitute a timing cycle for the logic circuits of its said unit;
- distributive control means connected to each of said unit clocking circuits operable to generate a start signal for selected ones of said clocking circuits; and
- signal output means in each said clocking circuit for providing a completion signal upon conclusion of a said predetermined series of timing signals.

3,919,696
MONITOR SYSTEM FOR SENSING DISCRETE POINTS

Robert A. Nater, Granada Hills; Charles E. Rolston, Santa Ana; Edward D. Hoover, Placentia; William F. Gunning, Los Altos Hills, and Robert P. King, Anaheim, all of Calif., assignors to Walt Disney Productions, Glendale, Calif.

Continuation of Ser. No. 105,560, Jan. 11, 1971. This application Dec. 10, 1973, Ser. No. 422,986
Int. Cl.[2] G06F *3/04*
U.S. Cl. 340—172.5 13 Claims

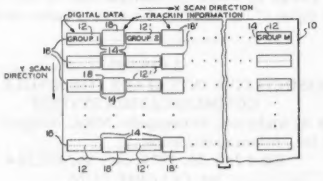


1. In a system for monitoring the status of discrete devices and transmitting status information to an external computer, the combination comprising:
- a. a group of said discrete devices, each of said discrete devices being in (1) a normal state, or (2) an off-normal state;
- b. means for generating an interrogation signal for initiating a determination of said states of said devices;
- c. scanning means coupled to said generating means to receive said interrogation signal, said scanning means for scanning said states of all of said discrete devices in said group simultaneously, said scanning means including means for generating a first response signal dependent on said states of said discrete devices in said group;
- d. means responsive to said first response signal for scanning each of said discrete devices individually when at least one of said devices in said group is in said off-normal state; and
- e. means responsive to said individual scanning means for generating a second response signal to said computer in accordance with said state of each of said devices in said group only when at least one of said devices in said group is in said off-normal state, said computer for outputting predetermined signals to said discrete devices for control thereof responsive to said second response signal generation.

3,919,697
DATA RECORD TRACKING USING TRACK IDENTIFYING INFORMATION IN THE GAPS BETWEEN RECORDED DATA GROUPS

Ray A. Walker, Kennewick, Wash., assignor to The Battelle Development Corporation, Columbus, Ohio

Filed June 26, 1974, Ser. No. 483,131
Int. Cl.[2] G11B *21/10, 17/00*
U.S. Cl. 340—173 R 21 Claims



1. A method of playback tracking of a record of data recorded in spaced data groups on said record in a plurality of adjacent data track lines, comprising:
- scanning a sensing means along the track lines of said record one line at a time to sense said data;
- sensing tracking information recorded on said record in said data track lines at positions spaced along each line, said tracking information being provided in the gaps between data groups so that it is sensed at a different time than said data is sensed and said tracking information being distinguishable from said recorded data when scanned by said sensing means, said tracking information including track identifying information which is different for adjacent track lines;
- detecting the output of the scanned sensing means to produce an electrical readout signal corresponding to the data and tracking information being scanned;
- sampling said readout signal at least at times corresponding to the occurrence of track identifying information in the two lines on opposite sides of the one line being scanned and immediately adjacent thereto in order to provide first and second sample signals;
- storing said first and second sample signals;
- comparing the stored first and second sample signals to provide an electrical correction signal corresponding to the difference between said sample signals; and
- applying said correction signal to a tracking means for moving said sensing means toward the center of the line being scanned by an amount proportional to said correction signal.

3,919,698
METHOD OF REDUCING THE OPTICAL NOISE PRODUCED BY A MOTION ON AN ILLUMINATED SURFACE, AND OPTICAL DEVICES FOR IMPLEMENTING SAID METHOD

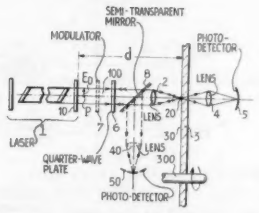
Claude Bricot; Jean-Pierre Lacotte; Francois Le Carvennec; Jean-Claude Lehureau, and Jean-Pierre Le Merer, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,443

Claims priority, application France, Mar. 21, 1973, 73.10142

Int. Cl.² G11C *13/04, 7/02*

U.S. Cl. 340—173 LM **6 Claims**



1. A method of reducing optical noise in an optical system comprising an illumination source emitting a beam of rectilinearly polarised radiation, and a flat surface moving perpendicularly to said beam, said method consisting in placing between said illumination source and said moving surface, a double-refracting plate; said double-refracting plate having neutral axes arranged at 45° to the plane of polarisation of said source and producing, between two vibrations propagating parallel to said neutral axes, a phaseshift equal to an odd multiple of a quarter of the wavelength of emission of said source.

3,919,699
MEMORY CIRCUIT

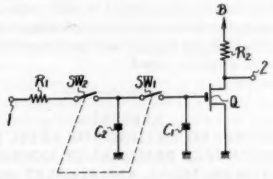
Yasuhiro Hideshima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,313

Claims priority, application Japan, June 30, 1973, 48-77693[U]

Int. Cl.² G11C *11/24, 7/00*

U.S. Cl. 340—173 CA **3 Claims**



1. A memory circuit, comprising:

an input terminal for receiving an input voltage to be stored;

an insulated gate field effect transistor having a gate electrode to which a stored voltage is applied, an output electrode for producing an output voltage proportional to said stored voltage, and a common electrode;

a first capacitor having high leakage resistance connected between said gate electrode and said common electrode for storing said input voltage and for applying same to said gate electrode;

a second capacitor for receiving said input voltage and having one terminal connected to said common electrode and a second terminal;

first switch means for connecting said second terminal of said second capacitor to said gate electrode so that said first and second capacitors are connected in parallel; and

second switch means ganged for simultaneous operation with said first switch means for connecting said first and second capacitors to said input terminal to enable said input voltage to be applied thereto, whereby when said first and second switch means are opened, only said first capacitor is connected to said insulated gate field effect transistor to supply said stored voltage thereto.

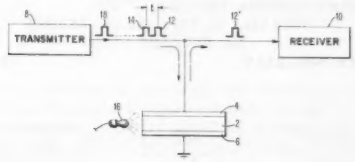
3,919,700
MEMORY SYSTEM

Joseph Cozzo, Brooklyn; David K. Garrod, Yorktown Heights; Thomas G. Kazyaka, Yorktown Heights; Robert L. Melcher, Yorktown Heights, and Norman S. Shiren, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 22, 1974, Ser. No. 490,527

Int. Cl.² G11C *11/42*

U.S. Cl. 340—173 MS **16 Claims**



1. A device for obtaining storage of information comprising a material containing defect sites on which electrons can be trapped and such traps can be subsequently ionized by electric fields,

means for applying charging light to said material to fill electron traps therein,

means for propagating an r.f. acoustic pulse through said material wherein said acoustic pulse serves as an information-bearing pulse, and

means for applying a second r.f. pulse to said material during the presence of said acoustic pulse so as to write said information-bearing pulse as a stable pattern of trapped electrons having the same spatial variations as said acoustic pulse so that the phase and amplitude of said acoustic pulse is retained in the material.

3,919,701
SYMMETRIC SWITCHING FUNCTIONS USING MAGNETIC BUBBLE DOMAINS

Hsu Chang, Yorktown Heights, N.Y.; Tien Chi Chen, and Chin Tung, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,665

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G11C *11/14, 19/00*

U.S. Cl. 340—174 TF **34 Claims**

9. A process for performing symmetric switching functions using magnetic bubble domains, comprising:

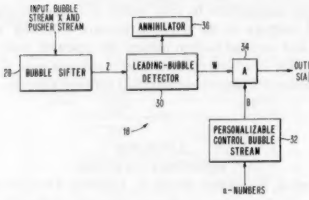
providing a magnetic medium in which said bubble domains can exist,

counting the number of magnetic bubble domains in an input data pattern and providing an output representing said count,

providing a selected pattern of bubble domains corresponding to said function to be performed, and

comparing said output representing said counting step with said selected pattern of bubble domains corresponding to said function, and

providing an output representative of said comparision.



3,919,702

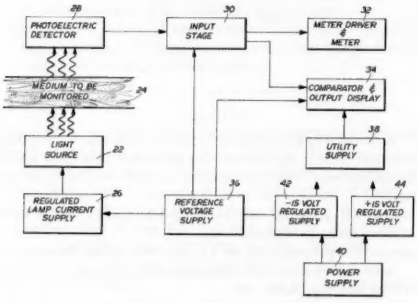
SMOKE DETECTOR

William H. Hayes, Ridgewood, N.J., and David P. McConnell, Hallsville, Mo., assignors to Reliance Instrument Manufacturing Corporation, Lodi, N.J.

Filed Mar. 18, 1974, Ser. No. 452,313

Int. Cl.² G08B *17/10*

U.S. Cl. 340—237 S **3 Claims**



1. A solid state system for monitoring the opacity of a variable density medium and for providing an output signal in response thereto comprising a source of light adapted to be positioned on one side of said medium, means for regulating the current to said source of light to ensure that the intensity and color temperature of light produced by said source is a constant value, said means comprising a voltage-controlled, constant-current source including an operational amplifier having an output controlling the conduction of an electronic switch to regulate the magnitude of current provided to said light source, said voltage controlled, constant-current source being provided with a stabilized reference voltage, receiving means comprising photoelectric means disposed opposite said light source, with said medium interposed therebetween, to sense the level of light passing through said medium, indicator means, a balanced current-to-voltage converter comprises a pair of integrated circuit operational amplifiers formed on a common substrate and having an extremely low input resistance to provide a first signal to said indicator means and which is a linear function of the magnitude of light received by said photoelectric means, and an intermediate amplifier having differential inputs, one of said inputs being provided by one of the operational amplifiers of the balanced current-to-voltage converter and the other input being provided by the other of the operation amplifiers of said converter, said intermediate amplifier providing said first signal, said indicator means comprising a meter and a voltage controlled constant current source responsive to said first signal from the balanced current-to-voltage converter for regulating the magnitude of current flowing through said meter, to provide an output signal.

3,919,703

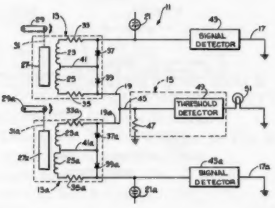
FAULT DETECTION SYSTEM FOR TRANSDUCERS

Curtis E. Stevens, Irvine, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Apr. 8, 1974, Ser. No. 458,979

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 R **11 Claims**



1. A fault detection system for transducers comprising:

first aand second transducers, each of said transducers being adapted to receive alternating current;

said first transducer including means responsive to a first variable condition for providing a first direct current signal which varies with said first variable condition;

a common conductor;

means for coupling the common conductor to said first and second transducers whereby said first direct current signal can be applied to the common conductor;

the alternating current from said first and second transducers tending to cancel each other out during normal operation of the first and second transducers whereby the current amplitude on said common conductor is relatively low under normal operation of the first and second transducers and increases at least to a predetermined amplitude in response to a failure of one of said first and second transducers;

said first direct current signal being of a lower amplitude than said predetermined direct current amplitude; and

failure detection means coupled to said common conductor and responsive to the current amplitude on said common conductor being at least at said predetermined amplitude to provide a failure signal.

3,919,704

SYSTEM AND METHOD FOR DETECTING UNAUTHORIZED REMOVAL OF GOODS FROM PROTECTED PREMISES, AND MAGNET DETECTING APPARATUS SUITABLE FOR USE THEREIN

Allan L. Williams, Mt. Penn, and Lyle D. Heck, Reading, both of Pa., assignors to Check Mate Systems, Inc., King of Prussia, Pa.

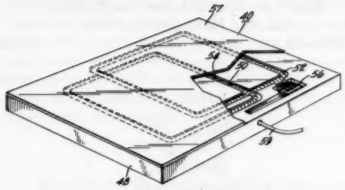
Filed Dec. 4, 1972, Ser. No. 311,767

Int. Cl.² G08B *21/00*

U.S. Cl. 340—280 **1 Claim**

1. Apparatus for detecting the presence of a magnet secured to goods adjacent a counter, comprising a mat-like housing adapted to lie flat on said counter, at least a pair of similar partially-overlapping electrical conductor coils lying flat within said housing and connected so that current is induced in any of said conductors by said magnet only when said magnet is adjacent said conductors and in motion relative to said conductors, and indicator means connected to said at

least pair of conductor coils for producing indications in response to currents induced in said conductors by adjacent



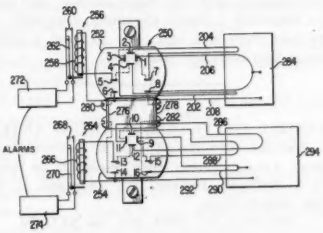
movement of said magnet and non-responsive to the effects on said coils of extraneous magnetic fields from remote sources.

3,919,705

LOOP CORD ALARM SYSTEM

Joseph L. Stendig, 2500 Riverside Drive, and Claude A. Davis, 568 Piney Forest Road, both of Danville, Va. 24541

Filed Feb. 5, 1973, Ser. No. 329,465
Int. Cl.² G08B *21/00*
U.S. Cl. 340—280 **7 Claims**



1. A protection system for electrical appliances comprising:

a plug having at least four mutually insulated prongs extending therefrom;

conductor means extending from the plug to at least one electrical appliance for energizing the one electrical appliance;

said conductor means including a plurality of conductive loops connected across respective pairs of the four prongs and extending from said plug to the one electrical appliance;

receptacle means having at least four contacts in at least three spaced prong receiving openings therein and matable with the respective four prongs of said plug with two of said contacts adapted to be energized by a pair of incoming power lines;

indicator means operated by de-energization thereof; and

circuit means connected to said receptacle contacts for completing a series circuit including a selected arrangement of said plurality of conductive loops, said indicator means and said two contacts when said plug is inserted in said receptacle;

said series circuit including at least one of said loops connected between contacts in different openings of the three receptacle openings;

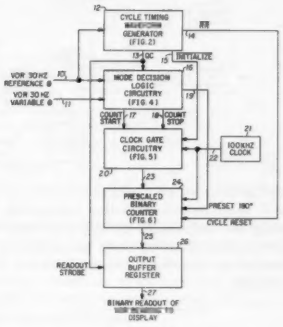
whereby opening any of the plurality of loops such as during the removal of said one electrical applicance will operate said indicator means.

3,919,706

DIGITAL VOR BEARING CONVERTER WITH TIME AVERAGING

Donald K. Grimm, Marion, and Floyd M. Totten, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 24, 1973, Ser. No. 409,114
Int. Cl.² H03K *13/20*
U.S. Cl. 340—347 AD **17 Claims**



1. In a converter circuitry of the type developing a binary readout of the phase displacement angle between first and second coherent frequency signals by developing a gating waveform the width of which is proportional to said phase displacement angle and gating a clock source into a binary counter in accordance with this gate width to effect a count accumulation in said counter corresponding to said phase displacement angle;

the method for developing a count accumulation in said counter which is the time average of a plurality of sampled accumulations comprising the steps of: scaling said counter to accumulate during each of a plurality of S cycles of said first signal a count corresponding to $1/S$ times the count actually definitive of an existing phase angle between said input signals, strobing the output of said counter to output utilization means during the ensuing cycle $(S+1)$ period, logically defining during said $(S+1)$ time period, in response to the then existing phase displacement angle between said first and second signals, a first operational mode for phase displacements in excess of zero by n degrees and less than 360 by at least n degrees, where n is a continuing variable and a second operational mode for displacements other than the above-defined first operational mode displacements, presetting said counter during said $(S+1)$ time period to effect a reset thereof to zero in response to said first mode definition, and presettng said counter during said $(S+1)$ time period to effect a reset thereof to binary 180 in response to said second mode definition while utilizing the relative phase of the complement of said second input signal in defining said clock gate width for the ensuing sequence of S accumulation periods.

3,919,707

RADAR VIDEO PROCESSING SYSTEM

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

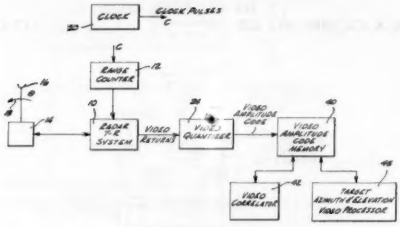
Filed Sept. 5, 1967, Ser. No. 665,383
Int. Cl.² G01S *7/44*
U.S. Cl. 343—5 DP **14 Claims**

1. A radar video processing system comprising:

first means responsive to signals received from range bins, defining range intervals, for providing a hit code for each range bin, the hit code being a function of the video returns from the range bin;

second means for storing the hit codes from a selected number of range bins related in azimuth and elevation; and

third means responsive to the hit codes in said second means for operating on said hit codes to determine the position of a target as a function of the hit code amplitudes and patterns of hit codes in selected adjacent range bins, said third means including comparing means for comparing the amplitudes of said code hits to select a predetermined number of code hits adjacent in at least one direction to determine the position of a target along said direction.



3,919,708

RANGING SYSTEMS

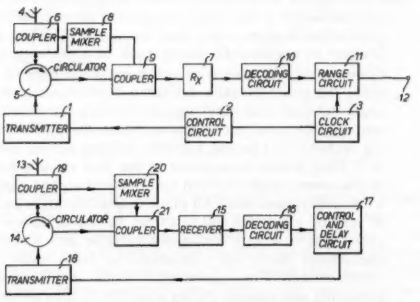
David Graham Pudsey, Essex, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Mar. 18, 1974, Ser. No. 452,211

Claims priority, application United Kingdom, Mar. 22, 1973, 13765/73

Int. Cl.² G01S 9/56, 7/40

U.S. Cl. 343—6.5 R **4 Claims**



1. A two-way ranging system for providing an indication of the range between two stations by determining the time period between the time at which one of the stations transmits an interrogating pulsed signal to the other and the time at which said one station receives a response pulsed signal from the other, said one station including transmitter means for transmitting an interrogating pulsed signal, said other station including a receiver which includes a transmission frequency input circuit, means for transmitting a response pulsed signal, means for sampling said response pulsed signal to produce a test signal, means for applying said test signal to said transmission frequency input circuit, means connected to said receiver for decoding at a first time said interrogating pulsed signals received from said one station and for decoding at a second time said test signal, and means, connected to and controlled by said decoding means, and connected to said transmitting means for controlling the time at which the transmitting means is triggered to transmit said response pulsed signal to said one station so as to make the time period between said first time and said second time equal to a predetermined fixed period of time.

3,919,709

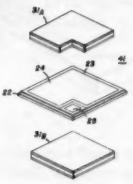
METALLIC PLATE-SEMICONDUCTOR ASSEMBLY AND METHOD FOR THE MANUFACTURE THEREOF

Paul W. Koenig, Clyde, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,343

Int. Cl.² H01L 23/48, 29/46

U.S. Cl. 357—65 **16 Claims**



1. A method for manufacturing semiconductor devices comprising the steps of:

providing a body of semiconductive material that defines first and second major surfaces and contains a preselected distribution of conductivity altering impurities such that at least one semiconductor device pellet is formed;

providing at least one metallic plate having at least one side coated with solder;

positioning said plate on said first major surface with said solder adjacent said first major surface, said positioning step comprising a shaker alignment step; and

heating said body and said plate to form a solder bond between said body and said plate.

3,919,710

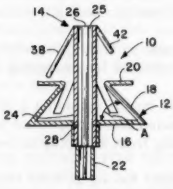
TURNSTILE AND FLARED CONE UHF ANTENNA

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Donald J. Bottoms, Denver, and Theofanis G. Gavrillis, Littleton, both of Colo.

Filed Nov. 27, 1974, Ser. No. 527,790

Int. Cl.² H01Q 13/12, 21/24, 21/26

U.S. Cl. 343—770 **11 Claims**



1. A broad beamwidth antenna for use at UHF comprising:

truncated cone means which is comprised of a cone base plate and cone sides which are cut off before reaching the cone apex, with equally spaced slots cut into said sides;

feed support means coaxial with the axis of said truncated cone and attached to the inside of said truncated cone means at a hole in the center of said cone base plate, extending beyond the cut-off sides of said cone sides, and containing feed slots in the feed support means sides;

center conductor means coaxial with and mounted within said feed support means and extending from the hole in the cone base plate to the opposite end of the feed support means, forming a coaxial conductor with the feed support means;

conductive tab means joining said center conductor means and said feed support means at the end remote from the cone base plate of said truncated cone;

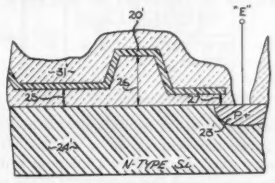
connector means attached to said center conductor means and said cone base plate; and

a turnstile means comprising at least two antenna arms means radially attached to said feed support means at the end remote from the cone base plate, equidistant from each other, whose sides are tilted back toward the cone base plate a visually perceptible amount, and each of whose axis is alined with the center line of one of the slots cut into the cone sides.

3,919,711
ERASABLE FLOATING GATE DEVICE

Sunlin Chou, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 26, 1973, Ser. No. 335,519
Int. Cl.² H01L 29/78
U.S. Cl. 357—23 **14 Claims**



1. A semiconductor storage device comprising:

a substrate of a first conductivity type;

a first and second spaced-apart region in said substrate of a second conductivity type to said first conductivity type, said regions defining a channel;

a third region in said substrate of said second conductivity type spaced apart from said channel;

a floating gate disposed above said channel and extending at least to said third region;

insulation means, insulating said floating gate from said substrate and surrounding said floating gate; and

contact means, coupled to said third region for permitting the application of an electrical signal to said region;

whereby charge may be transferred onto said floating gate by avalanche injection from said substrate and removed from said floating gate through said third region.

3,919,712
COLOR SIGNAL CONTROL SYSTEM FOR COLOR TELEVISION RECEIVERS

Masato Izumisawa, Yokosuka, and Senri Miyaoka, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,238
Claims priority, application Japan, Feb. 27, 1973, 48-23425
Int. Cl.² H04N 9/20, 9/537
U.S. Cl. 358—27 **6 Claims**

1. A signal control system comprising, in combination:

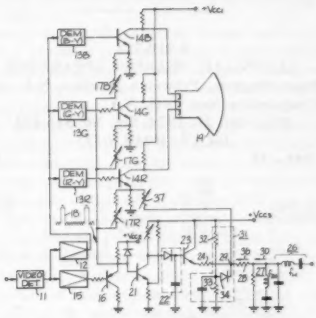
A. a color cathode ray tube comprising:

1. a screen covering an image area and comprising an array of a plurality of groups of color phosphors emitting light of different colors, respectively, and

2. a corresponding plurality of beam producing means for generating a plurality of electron beams directed toward said screen to impinge on respective ones of said groups of color phosphors;

B. a corresponding plurality of signal supplying circuit means responsive to incoming signals for supplying separate modulating signals to each of said beam producing means to modulate said respective electron beams in response to the respective levels of said modulating signals; and

C. control circuit means connected to at least one of said signal supplying circuit means for controlling the level of the corresponding signal supplied to the corresponding beam producing means to vary the luminosity of the color

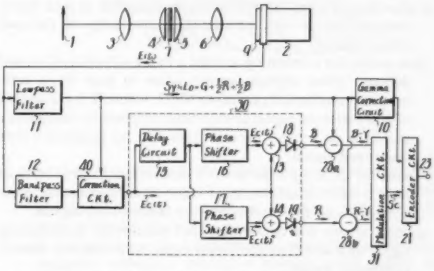


phosphor corresponding to the electron beam modulated by said corresponding moulating signal when the density of said beams exceeds a predetermined level that causes luminosity saturation of at least one of said color phosphors that is easier to saturate than at least a second one of said color phosphors.

3,919,713
COLOR TELEVISION CAMERA

Takashi Nakamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,780
Claims priority, application Japan, May 26, 1973, 48-59116
Int. Cl.² H04N 9/53
U.S. Cl. 358—32 **9 Claims**



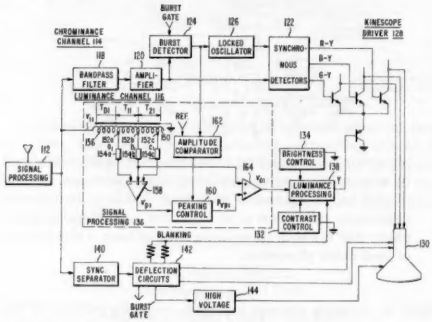
1. Color television camera apparatus for producing a video signal having good white balance irrespective of the change of intensity of incident light, comprising an image pickup tube having an image pickup surface which is scanned by successive scan lines thereacross; color filter means for separating an image of a viewed objective projected onto said image pickup surface into separate color components being constituted by two primary color components each having a modulated intensity across a scan line and a third primary color component having a substantially uniform intensity across said scan line; means for deriving frequency-separated signals in response to the scanning of said color separated components on said image pickup surface, said derived signals including two modulated signal components representing said two intensity-modulated primary color components and a substantially unmodulated signal component representing said uniform-intensity third primary color component; control signal generating means for generating a control signal proportional to the magnitude of said unmodulated signal component; and signal level control means for receiving at least said two modulated signal components and coupled to said control signal generating

means for receiving said control signal to vary the level of said received modulated signal components as a function of said control signal.

3,919,714
AUTOMATIC PEAKING APPARATUS

Joseph Peter Bingham, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,491
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—38 **15 Claims**



1. Apparatus for processing television video signals, including luminance, chrominance and color burst signal components, comprising:

a source of video signals:

signal delaying means coupled to said source of video signals;

a plurality of signal coupling means coupled to said signal delaying means for developing a plurality of delayed video signals;

first means for combining at least a first and a second of said delayed video signals spaced apart in time by a time interval substantially equal to NT/2, where T is the period of a preselected signal component supplied by said source and N is an integer greater than one, to produce a first combined signal;

means for deriving a bandwidth determining signal from at least a third of said delayed video signals located in time between said first and second delayed video signals;

second means for combining said bandwidth determining signal and said first combined signal to produce a second combined signal;

means for deriving a control signal from a predetermined portion of said video signals;

means for controlling the amplitude of said second combined signal in accordance with said control signal to produce a resultant signal; and

third means for deriving an output signal from at least said resultant signal.

3,919,715
EVENT RECORDER WITH RATCHET TAPE ADVANCE

William C. Galloway, and William T. Harrold, both of Seattle, Wash., assignors to G & H Instrumentation, Inc., Seattle, Wash.

Filed Dec. 5, 1973, Ser. No. 421,969
Int. Cl.[2] G01D *15/12;* **G11B** *15/20*
U.S. Cl. 360—6 **2 Claims**

1. A self-contained event recorder utilizing a magnetic tape to record the desired events and capable of continuous unattended operation, comprising:

enclosing and supporting means,

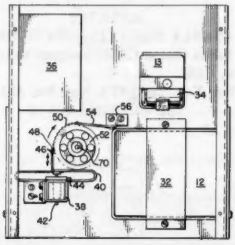
recording head means having a plurality of tracks mounted to the enclosing and supporting means,

means to secure a tape cartridge in an operational position adjacent the recording head means,

guide means adjacent the recording head means assuring accurate and consistent placement of a tape relative to the recording head means, thereby obtaining maximum utilization of the tape surface,

clock means secured to the enclosing and supporting means and adapted to give a time reference signal upon one track of the tape,

recording means responsive to the occurrence of the event for generating an impulse recorded upon the tape independent of the motion of the tape whereby impulses are recorded on the tape as events occur regardless of the motion of the tape, and

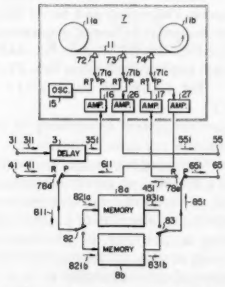


tape advancing means for periodically advancing the tape having a capstan secured to a ratchet wheel and a springbiased pawl actuated by a solenoid which engages the ratchet wheel such that movement of the pawl rotates the wheel, said pawl being secured to one side of an oblong, resilient member, the shaft of the solenoid extending through the other side of the resilient member and operating against the resilient member to drive the ratchet wheel by means of the pawl whereby the tape advancing means utilizes energy only upon the energization of the solenoid.

3,919,716
MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS FOR BANDWIDTH REDUCED VIDEO SIGNAL AND DELAYED AUDIO SIGNAL

Yasufumi Yumde, Yokohama; Sho Narita, Fujisawa; Mikio Murai, and Takashi Kubota, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 3, 1973, Ser. No. 376,134
Claims priority, application Japan, July 5, 1972, 47-66682
Int. Cl. H04m *5/78;* **H04n** *7/00*
U.S. Cl. 360—9 **10 Claims**



1. An apparatus for processing both video and audio signals comprising:

first means, which receives a plurality of successive video signals corresponding to a respective plurality of successive still pictures, for selectively storing, at standard video frequencies, a respective selected one of said video signals and for reading out the stored signal at a speed of the audio frequency band;

second means for receiving a plurality of successive audio signals; and

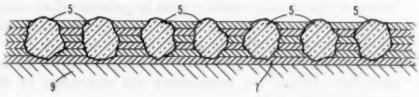
third means, coupled to said first and second means, for recording both said audio signals and stored video signals on respective recording channels in the same recording means at a speed corresponding to that for the audio frequency band, and wherein said third means includes delay means, coupled to said second means, for delaying the recording of a respective one of said audio signals for a period of time corresponding to the length of a video signal received by said first means and the length of the corresponding video signal recorded in said recording means.

3,919,717

WEAR-RESISTANT SURFACE FOR MAGNETIC HEADS CONSISTING OF DIAMOND PARTICLES

Francis M. Cullen; David D. Roshon, Jr., both of Binghamton, and Keith A. Snyder, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 24, 1974, Ser. No. 491,411
Int. Cl.[2] G11B *5/22*
U.S. Cl. 360—122 **4 Claims**



1. A magnetic head comprising a core of ferrous material and a wear-resistant contacting surface constituted by a large plurality of diamond particles in a matrix of softer material, said particles having a size and disposition to comprise a diamond particle density in which the projected surface area of said diamond particles comprises 60 to 70 percent of the total area of said surface.

3,919,718

LIQUID CRYSTAL-CONTAINING MAGNETIZED ARTICLE FOR VISUALLY INDICATING THE RECORDING OF A MAGNETIC SIGNAL

Albert C. Nolte, Jr., Oyster Bay, N.Y., assignor to Elton Industries, Inc., Jericho, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,036
Int. Cl. G11b *5/62, 27/22*
U.S. Cl. 360—131 **1 Claim**

1. In a magnetized article adapted for the recording thereon by means of recording equipment, including a magnetic head, of a magnetic information signal corresponding to an electrical information signal, said article including a magnetic material on which the magnetic information signal is recorded, the improvement comprising a liquid crystal substance contained in the article and a response of which to the magnetic information signals produced by the magnetic head of the recording equipment is a change in an optical property of the substance.

3,919,719

SURFACE LUBRICATION OF MAGNETIC MEDIA

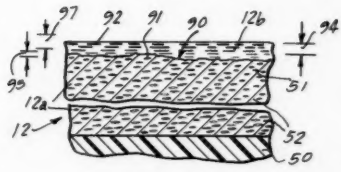
Charles Donald Wright, Hanover Park; Kurt Gutfreund, Park Forest, and John Brzuskiewicz, Dolton, all of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Apr. 4, 1974, Ser. No. 458,051
Int. Cl.[2] G11B *5/72, 5/78, 5/84*
U.S. Cl. 360—134 **10 Claims**

1. In a magnetic transducing system for operation at temperatures above a minimum ambient operating temperature, said system comprising a magnetic transducer head having a record contact face for continuous pressure contact with a magnetic record element during a transducing operation, a transport apparatus for producing relative movement between a magnetic record element and said magnetic transducer had at a transducing speed, said transport apparatus comprising means for maintaining pressure contact between said magnetic transducer head and a magnetic record element during a transducing operation substantially at an operating contact pressure value,

a magnetic record element for storage at temperatures above a minimum ambient storage temperature and constructed for coupling with said transport apparatus during a transducing operation for the maintenance of the pressure contact of said record element with said transducer head substantially at said operating contact pressure value continuously during the relative movement thereof at said transducing speed, and said record element including a base and a magnetizable layer on said base defining an active side of the record element with said magnetizable layer having a surface with an actual wettable surface area available for wetting by a liquid substantially in excess of its geometric surface area, and

a liquid forming an external liquid-state surface film at the active side of said magnetic record element and essentially occupying said actual wettable surface area of said magnetizable layer and having a thickness exceeding a minimum thickness sufficient for continuous liquid-state lubricating contact with said record contact face of said magnetic transducer head during a transducing operation, said liquid-state film being subject to a maximum



working temperature after indefinitely extended continuous pressure contact with said record contact face at said operating contact pressure value during relative movement at said transducing speed.

said liquid-state surface film being comprised of a low vapor pressure substance having a melting point below the minimum ambient storage and operating temperatures of the magnetic record element and a boiling point above the maximum working temperature, and providing a liquid-state layer covering essentially all high points of the surface of said magnetizable layer and being essentially free of any solid state lubricating particles, and

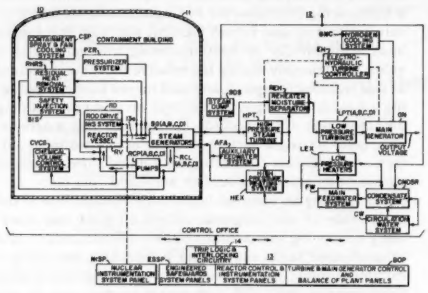
said liquid being adsorbed to said magnetizable layer of said record element as an effective lubricating overlayer of a maximum thickness of less than one micron, the maximum thickness of said lubricating overlayer being less than an upper limit thickness correlated directly with said actual wettable surface area of the magnetizable layer occupied by said liquid and correlated inversely with said operating contact pressure value such that said lubricating overlayer forms a permanently integral and unitary part of the record element in spite of repeated transducing operations at said operating contact pressure value and at said transducing speed, and essentially without any transfer of said liquid to said record contact face of said transducer head during unlimitedly repeated transducing operations.

3,919,720

NUCLEAR POWER PLANT TRAINING SIMULATOR MODELING ORGANIZATION AND METHOD

William H. Alliston, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1973, Ser. No. 335,295
Int. Cl. G06f *15/06, 15/56;* G09b *9/00*
U.S. Cl. 444—1 112 Claims



1. An automated training simulator for a nuclear powered electrical generating plant in which a nuclear reactor generates heat that is transferred by a reactor coolant system to operate a steam turbine for operating an electrical generator wherein discrete selected portions of the representative plant are each represented in a model that uses input data generated by other models to generate physical values that are used as input data by still other models, each model responds in a manner similar to the physical portion of the plant that it represents; comprising

a control console with a plurality of manually operable and automatic devices which correspond to distinct plant control devices to provide input data to predetermined models;

calculating means which includes sequence controlling means having the following components a. first model means to generate data values relating to the operation of a nuclear reactor including data values relating to reactor coolant enthalpy in response to the operation of selected control rod devices on the console,

b. second model means governed by the generated data values of the first model means to generate data values relating to the operation of a reactor coolant system including data values relating to coolant system fluid temperature,

c. third model means governed by data values including the reactor coolant system data values to generate data values relating to the operation of a secondary steam system including data values relating to turbine speed and mechanical power,

d. fourth model means governed by the generated data values of the second model means to generate data values relating to the operation of an electrical generator including data values relating to generator power output;

and indicating devices governed by predetermined generated data values for monitoring the operation of the representative plant.

DESIGN PATENTS

GRANTED NOVEMBER 11, 1975

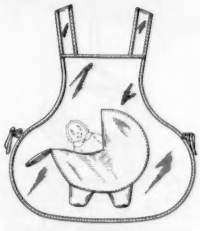
ERRATA

For CLASS	See PATENT NO.
034–015 AD	237,204

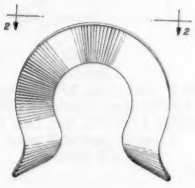
DESIGNS

NOVEMBER 11, 1975

237,557
APRON
Doris Brosk, 150 E. 69th St.,
New York, N.Y. 10021
Filed Sept. 17, 1973, Ser. No. 397,860
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—228



237,558
ACOUSTICAL HEADBAND
Blaise Calame, 8 rue Gay-Lussac, Paris, France
Filed Sept. 25, 1973, Ser. No. 400,510
Claims priority, application Sweden Mar. 26, 1973
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—259



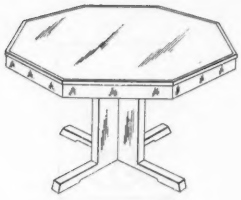
237,559
PILLOW CASE
Versie M. Johnston, 11914 E. 62nd Terrace,
Kansas City, Mo. 64133
Filed May 13, 1974, Ser. No. 469,235
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D2—264

237,560
PILLOW CASE
Versie M. Johnston, 11914 E. 62nd Terrace,
Kansas City, Mo. 64133
Filed May 13, 1974, Ser. No. 469,241
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D2—264

237,561
BELT MOUNTABLE OPTICAL EYEGLASS CASE HOLDER
Robert A. Kesner, 4714 N. Miller Road,
Scottsdale, Ariz. 85251
Filed June 5, 1974, Ser. No. 476,429
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

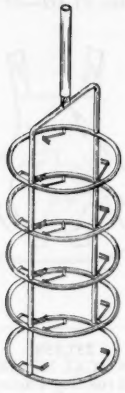
237,562
SPIKE FOR A SHOE
Nobuyuki Mori, Takasago, Japan, assignor to
Onitsuka Co., Ltd., Kobe, Japan
Filed Aug. 20, 1973, Ser. No. 389,950
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—314

237,563
CONVERTIBLE GAME TABLE
Gary A. Gerber, Weston, and Melvin Zimmers, Westport, Conn., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Aug. 8, 1973, Ser. No. 386,598
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

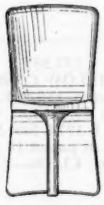


237,564
PEDESTAL TABLE
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 2, 1973, Ser. No. 337,707
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

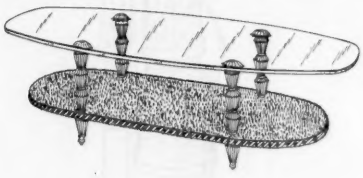
237,565
MULTIPLE SUBSTRATE HOLDER
Robert G. Warren, Anaheim, Frederick S. Stearns, Placentia, and Eugene C. Whitcomb, Mission Viejo, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 1, 1974, Ser. No. 456,518
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28



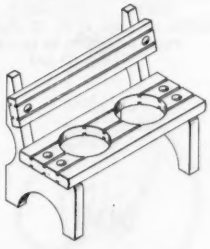
237,566
CHAIR
Ralph E. Doty, Jr., 325 Harvard St., Cambridge, Mass. 02039
Filed May 17, 1974, Ser. No. 470,851
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



237,567
COCKTAIL TABLE
Norman C. Korn, 1337 E. 80th St., Brooklyn, N.Y. 11236
Filed May 28, 1974, Ser. No. 473,753
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

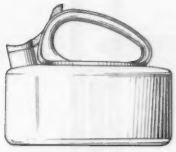


237,568
SUPPORT FOR POTTED PLANTS
Marvin H. Nelson, 4600 Sierrawood Lane, Pleasanton, Calif. 94566
Filed Oct. 29, 1974, Ser. No. 518,895
Term of patent 14 years
Int. Cl. D6—*01, 06*
U.S. Cl. D6—182

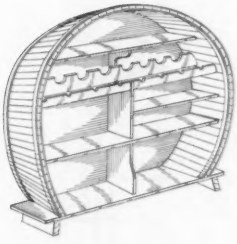


237,569
PILLOW
Monica P. De Rue, 307 Lake Shore Drive, Wildwood, Ill. 60030
Filed July 30, 1973, Ser. No. 383,788
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—203

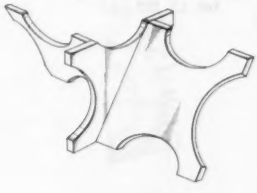
237,570
TEA KETTLE
Michael Lax, 68 E. 91st St., New York, N.Y. 10028
Filed Mar. 8, 1974, Ser. No. 449,491
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—60



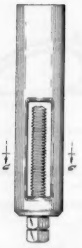
237,571
SHELF UNIT OR SIMILAR ARTICLE
Vernon E. Lane, Jr., 211105 Brooklawn Drive, Dearborn Heights, Mich. 48127
Filed Mar. 28, 1974, Ser. No. 455,794
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



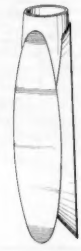
237,572
LEG FOR A TABLE OR LIKE STRUCTURE
Kenichi Koyama, Yokohama, Japan, assignor to Central Glass Company Limited
Filed Mar. 13, 1974, Ser. No. 450,904
Claims priority, application Japan Jan. 22, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



237,573
ADJUSTABLE LEG
Thomas J. Haug, 2214 Franklin St., Manitowoc, Wis. 54220
Filed Mar. 12, 1974, Ser. No. 450,511
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

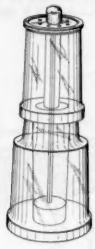


237,574
TUMBLER
Frank Goertzen, 1 Oriole Road, Toronto M4V 2E7, Ontario, Canada
Filed Mar. 28, 1974, Ser. No. 455,940
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

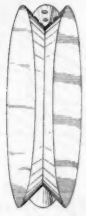


237,575
CONDIMENT BOWL
Marshall Hamilton, Michigan City, Ind. (240 Bowman Drive, Newport, Tenn. 37821)
Filed May 6, 1974, Ser. No. 467,203
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—20

237,576
SALT/PEPPER MILL
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,928
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—53

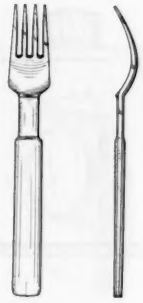


237,577
CONDIMENT SHAKER
Frank Goertzen, 1 Oriole Road, Toronto M4V 2E7, Ontario, Canada
Filed Mar. 28, 1974, Ser. No. 455,937
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54



237,578
COOKER
Robert W. Thomas, Wichita, Kans., assignor to William D. De Vore and R. A. De Vore, Wichita, Kans.
Continuation-in-part of design application Ser. No. 196,254, Nov. 5, 1971, now Patent No. 229,625. This application Feb. 12, 1973, Ser. No. 331,544
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

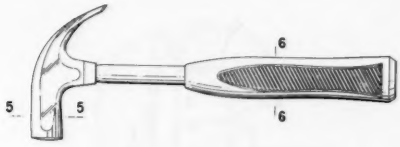
237,579
FORK OR SIMILAR ARTICLE
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed July 3, 1974, Ser. No. 485,650
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



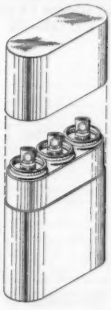
237,580
WOOD HOLDER
Wesley Lampinen, Richardson Road, Ashby, Mass. 01431
Filed July 29, 1974, Ser. No. 492,604
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—212

237,581
BOTTLE OPENER OR SIMILAR ARTICLE
Michael J. Pasquale, 115 Grove St., Middletown, Conn. 06457
Filed June 27, 1974, Ser. No. 483,880
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—18

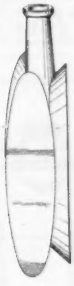
237,582
HAMMER
Peter Frederick Mostyn, Stafford, England, assignor to Spear & Jackson (Tools) Limited, Wednesbury, England
Filed Mar. 12, 1973, Ser. No. 340,371
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—75



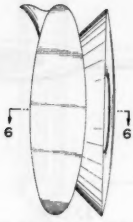
237,583
PLURAL COMPARTMENT PRESSURIZED DISPENSING CONTAINER
Norman Howard Kemp, 8585 N. Stemmons-Freeway, Suite 931, Dallas, Tex. 75247
Filed July 13, 1973, Ser. No. 378,811
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—18



237,584
BOTTLE
Frank Goertzen, 1 Oriole Road, Toronto M4V 2E7, Ontario, Canada
Filed Mar. 28, 1974, Ser. No. 455,938
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—54



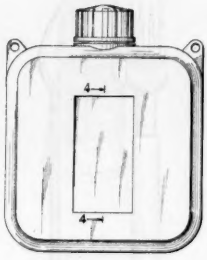
237,585
PITCHER
Frank Goertzen, 1 Oriole Road, Toronto M4V 2E7, Ontario, Canada
Filed Mar. 28, 1974, Ser. No. 455,939
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64



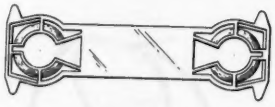
237,586
COMBINED JAR AND STOPPER
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Jan. 4, 1974, Ser. No. 430,685
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—118

237,587
PACKAGING CONTAINER FOR BEAN CURD OR THE LIKE
Shiro Yukimitsu, 3 of 6, 1-chome, Fukae Kitamachi, Higashinadaku, Kobe, Japan
Filed Aug. 3, 1973, Ser. No. 385,532
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

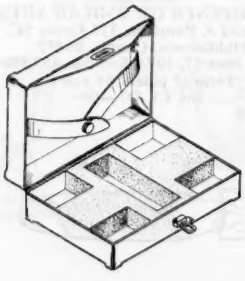
237,588
CANTEEN
Bernard C. Sharp, White Plains, N.Y., assignor to Poloron Products, Inc., New Rochelle, N.Y.
Filed Mar. 1, 1973, Ser. No. 337,200
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—168



237,589
BOTTLE CARRIER
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed July 3, 1974, Ser. No. 485,727
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—178

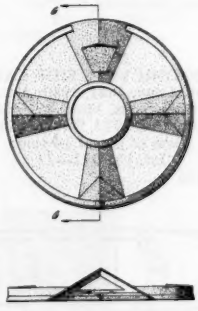


237,590
GAME BOX
John R. Scantlin, Los Angeles, Calif., assignor to National Game Corporation, Los Angeles, Calif.
Filed Jan. 2, 1974, Ser. No. 429,575
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185

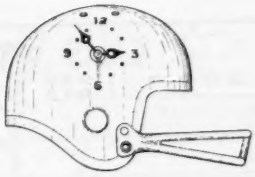


237,591
PACKAGING CONTAINER FOR CHEMICALLY IMPREGNATED WIPES OR THE LIKE
Ronald R. Gutkowski, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed May 6, 1974, Ser. No. 466,924
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

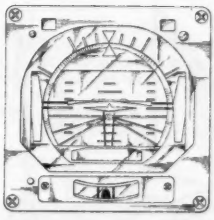
237,592
POUR SPOUT LID
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed July 5, 1973, Ser. No. 376,570
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



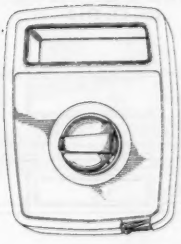
237,593
CLOCK
Clarence V. Tibbs, P.O. Box 10518, Knoxville, Tenn. 37919
Filed May 2, 1974, Ser. No. 466,160
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6



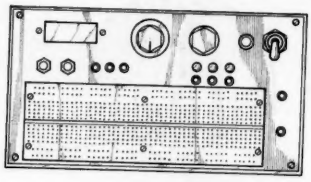
237,594
AIRCRAFT FLIGHT INSTRUMENT
Lee J. Vetter, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.
Filed July 12, 1973, Ser. No. 378,706
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—67



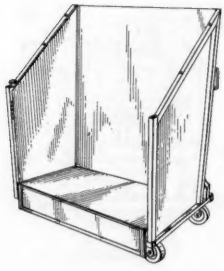
237,595
MEASURING TAPE
Edward Meisner, Fort Lee, N.J., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Apr. 22, 1974, Ser. No. 463,049
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72



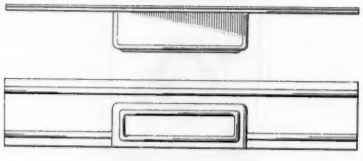
237,596
COMBINED TRANSISTOR-INTEGRATED CIRCUIT TESTER AND DESIGN AID
Joseph Don Jack, 314 Warren St., Harrison, N.J. 07029
Filed Sept. 28, 1973, Ser. No. 401,595
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—75



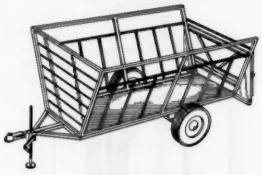
237,597
PORTABLE DISPLAY CART
Richard Allen Clarke, Greenwich, and William James Chvala and Raymond Edward De Witte, Danbury, Conn., assignors to PepsiCo, Inc., Purchase, N.Y.
Filed May 14, 1974, Ser. No. 469,782
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25



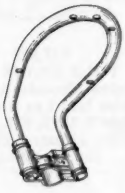
237,598
TRUCK BOX SIDE PANEL
Jerry Edward Jacobs, Northwood, Iowa, assignor to Winnebago Industries, Inc., Forest City, Iowa
Filed May 3, 1974, Ser. No. 466,697
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—98



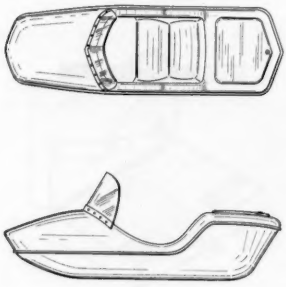
237,599
PORTABLE ROUND BALE FEEDER
Richard D. Cox, P.O. Box 387, Carrollton, Mo. 64633
Filed Sept. 26, 1974, Ser. No. 509,707
Term of patent 14 years
Int. Cl. D12—*10*; D30—*03*
U.S. Cl. D12—105



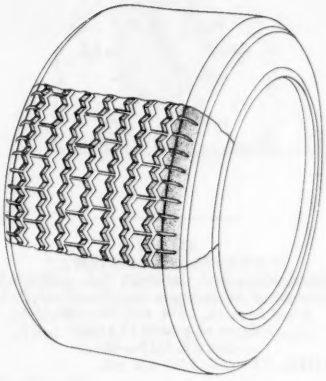
237,600
MOUNTING BRACKET FOR BICYCLE
Irvin E. Berger, Skokie, and Kenneth F. Welter, Addison, Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.
Filed Feb. 4, 1974, Ser. No. 439,265
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



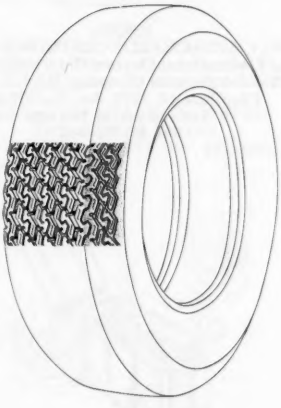
237,601
MOTORCYCLE SIDE CAR
Allan W. Lund, 2641 118th Ave. NW., Minneapolis, Minn. 55433
Filed June 24, 1974, Ser. No. 481,964
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—116



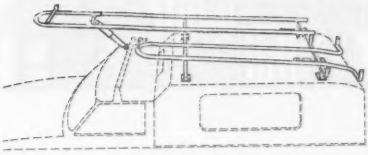
237,602
TIRE FOR A VEHICLE WHEEL
Roger Derek Sanders, Barton-under-Needwood, England, assignor to Dunlop Limited, London, England
Filed Aug. 2, 1974, Ser. No. 494,296
Claims priority, application Great Britain Feb. 6, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



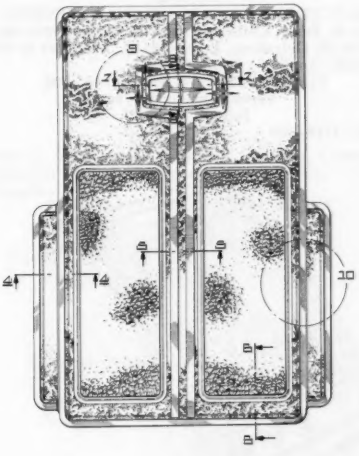
237,603
TIRE
Lance R. McKissick, Boulder, Colo., and James W. Stiffler, Tallmade, and Allen R. Wilson, Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Nov. 12, 1973, Ser. No. 415,032
(Filed under Rule 47(a) and 35 U.S.C. 116)
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



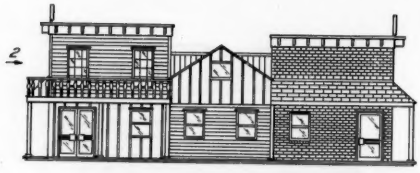
237,604
MAINTENANCE VEHICLE LADDER RACK
Hiroshi Kira, 8227 Remmet, Canoga Park, Calif. 91304
Filed Aug. 14, 1974, Ser. No. 497,141
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



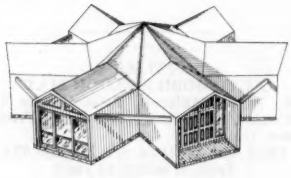
237,605
AUTOMOBILE FLOOR MAT
Charles A. Wells, Millcreek Estates, near Marysville, Union County, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Apr. 11, 1974, Ser. No. 459,914
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



237,606
WESTERN STYLE BUILDING
Ruut van den Hoed, Valley Forge, Pa., assignor to The Rustler, Inc., King of Prussia, Pa.
Filed July 30, 1973, Ser. No. 383,853
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

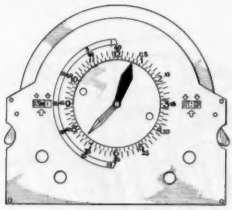


237,607
DWELLING CONSTRUCTION
Ignacio L. Torres, Jr., 501 Oakwood, San Antonio, Tex. 78228
Filed Jan. 28, 1974, Ser. No. 437,144
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

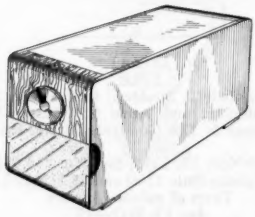


237,608
ELECTRONIC INSTRUCTIONAL CONSOLE
George R. Dean, Chicago, James B. Ricks, Evanston, and David D. Dalenberg, Lombard, Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Feb. 25, 1974, Ser. No. 445,386
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60

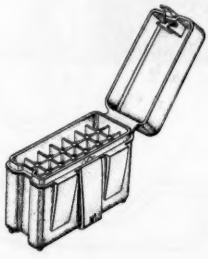
237,609
TIME TEACHING AID
John J. Doherty, 306 N. Concord Ave., Fullerton, Calif. 92631
Filed Dec. 19, 1973, Ser. No. 426,322
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



237,610
PENCIL SHARPENER
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed June 18, 1974, Ser. No. 480,416
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73

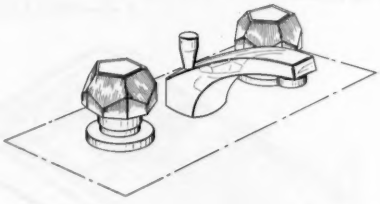


237,611
BELT ATTACHABLE CARTRIDGE CASE
William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed June 18, 1973, Ser. No. 370,670
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—14

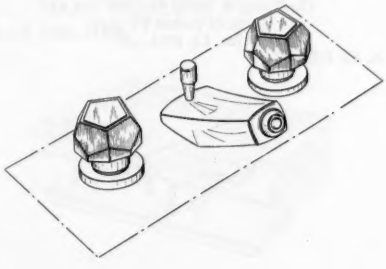


237,612
FISH LURE
James D. Maxwell, Box 649, Vancouver, Wash. 98665
Filed Sept. 7, 1973, Ser. No. 395,373
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

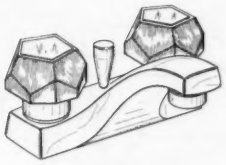
237,613
LAVATORY FIXTURE UNIT
Dominic A. Saporito, Fanwood, and Donald M. Genaro, Haworth, N.J., assignors to American Standard Inc., New York, N.Y.
Filed Sept. 26, 1974, Ser. No. 509,463
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



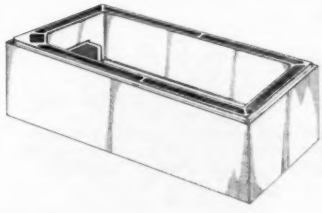
237,614
LAVATORY FIXTURE UNIT
Dominic A. Saporito, Fanwood, and Donald M. Genaro, Haworth, N.J., assignors to American Standard Inc., New York, N.Y.
Filed Sept. 26, 1974, Ser. No. 509,464
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



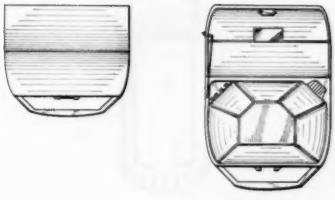
237,615
FAUCET
Dominic A. Saporito, Fanwood, and Donald M. Genaro, Haworth, N.J., assignors to American Standard Inc., New York, N.Y.
Filed Sept. 26, 1974, Ser. No. 509,797
Term of patent 14 years
Int Cl. D23—*01*
U.S. Cl. D23—25



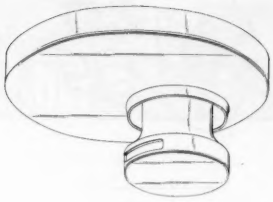
237,616
WHIRLPOOL BATHTUB
Leonard Gordon, Tarzana, Calif., assignor to Riviera Industries, Inc.
Filed Dec. 26, 1973, Ser. No. 427,720
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



237,617
PORTABLE SINK
Lawrie G. McIntosh, Mississauga, Ontario, Canada, assignor to Reliance Products Ltd., Winnipeg, Manitoba, Canada
Filed Nov. 2, 1973, Ser. No. 412,187
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



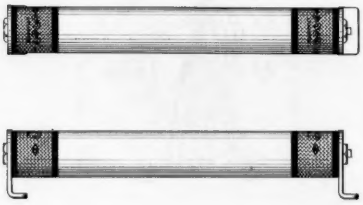
237,618
ADJUSTABLE AIR OUTLET
Birger Larkfeldt, Odensjo-Barnarp, and Lennart Widerby, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flakttabriken, Nacka, Sweden
Filed Dec. 12, 1974, Ser. No. 532,163
Claims priority, application Sweden June 13, 1974
Term of patent 14 years
Int. Cl. D23—*03, 04*
U.S. Cl. D23—141



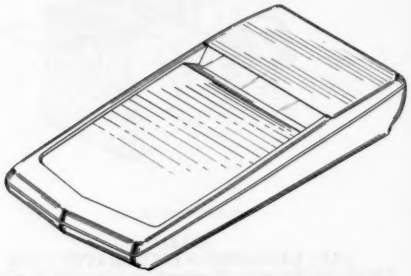
237,619
DISPENSING CONTAINER FOR A CAKE OF FABRIC SOFTENER AND ANTI-STATIC AGENT FOR USE IN AUTOMATIC CLOTHES DRYERS
John S. Levey, 4059 Mariner Circle, Westlake Village, Calif. 91361
Filed July 15, 1974, Ser. No. 488,444
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

237,620
REFRIGERATOR DEODORANT CONTAINER
David A. Jones, Bellbrook, and Howard H. McIlvain, Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Oct. 21, 1974, Ser. No. 516,067
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

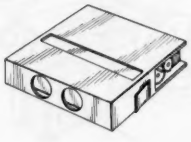
237,621
ELECTRIC FUSE FOR ELEVATED VOLTAGES
Frederick J. Kozacka, South Hampton, N.H., and Erwin Salzer, Waban, Mass., assignors to The Chase-Shawmut Company, Newburyport, Mass.
Filed May 30, 1972, Ser. No. 258,235
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



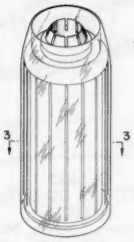
237,622
CASING FOR AN ELECTRONIC CALCULATOR OR THE LIKE
Terrell Oyama, Santa Clara, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed July 22, 1974, Ser. No. 490,538
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



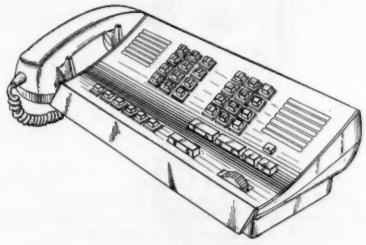
237,623
MAGAZINE FOR STORING INFORMATION ON TAPES
Paul A. Morgan, Chicago, Ill., assignor to Century Wheels Research Corp., Lake Bluff, Ill.
Filed Aug. 8, 1973, Ser. No. 386,629
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14 B



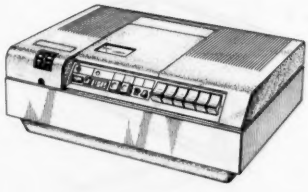
237,624
MAGNETIC TAPE CARTRIDGE
Helfried O. Rinkleib, Longmont, and Gary L. Switser, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 30, 1973, Ser. No. 420,506
Term of patent 14 years
Int. Cl. D14—*02, 99*
U.S. Cl. D26—14 B



237,625
TELEPHONE INTERCOMMUNICATING UNIT
Arnold Wolf, Los Angeles, Bruce A. Buell, Walnut Creek, and William E. Howe, Orinda, Calif., assignors to Voycall, Oakland, Calif.
Original design application July 3, 1972, Ser. No. 268,543, now Patent No. 231,740. Divided and this application Jan. 21, 1974, Ser. No. 434,918
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



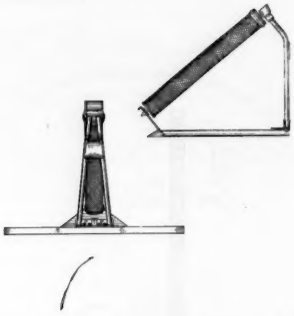
237,626
VIDEO CASSETTE RECORDER OR SIMILAR ARTICLE
Kenji Hamada, Tokyo, Japan, assignor to Hitachi Electronics, Ltd.
Filed Feb. 15, 1974, Ser. No. 443,019
Claims priority, application Japan Oct. 11, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



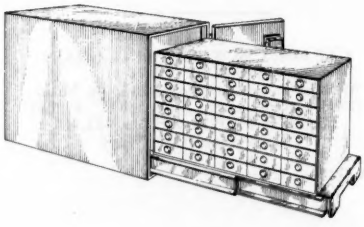
237,627
TELEVISION ANTENNA ROD FOR INDOOR USE
Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, N.Y. 11568
Filed Dec. 23, 1974, Ser. No. 535,197
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

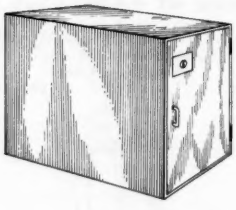
237,628
CAP FOR USE WITH A LINK CHAIN SUPPORT POST
Michael T. Russo, Bloomfield Hills, Mich. (1805 Larchwood St., Troy, Mich. 48084)
Filed May 20, 1974, Ser. No. 471,415
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D28—1 C

237,629
COMBINED ANIMAL OILER AND SCRATCHER
George W. Keene, P.O. Box 395, Rochelle, Ill. 61068
Filed Apr. 4, 1974, Ser. No. 457,924
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

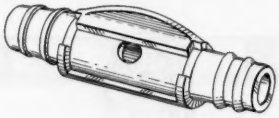


237,630
SAFETY DEPOSIT BOX SYSTEM
Ross H. Cantley, Beaconsfield, Quebec, Canada, assignor to The Royal Bank of Canada, Montreal, Quebec, Canada
Filed Aug. 28, 1974, Ser. No. 501,370
Claims priority, application Canada Aug. 8, 1974
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—22

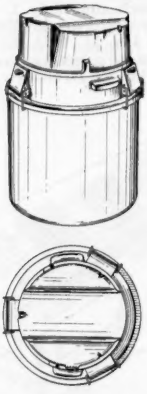




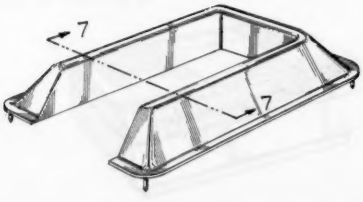
237,631
MEDICAL SUCTION VALVE
Marvin Katzman, 1520 202nd St., Bayside, N.Y. 11360, and Neil De Fluri, 952 Arnet Ave., Union, N.J. 07083
Filed Oct. 3, 1973, Ser. No. 403,032
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R



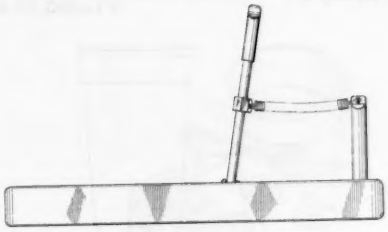
237,632
SAMPLE COLLECTOR OR OTHER SIMILAR ARTICLE
Louis Franklin Lederer, Lincoln, Nebr., assignor to Instrumentation Specialties Company
Filed Jan. 2, 1974, Ser. No. 429,508
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—2 B



237,633
GUIDE FOR GOLF PUTTER
George Hunt Weber, 1 Royal Palm Way, Palm Beach, Fla. 33480
Filed Sept. 21, 1973, Ser. No. 400,311
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



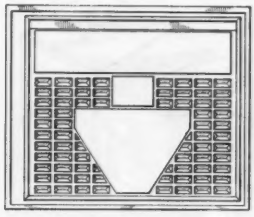
237,634
ARM MUSCLE EXERCISING APPARATUS
Glenn M. Ricketts, Rte. 1, Belle Center, Ohio 43310
Filed Oct. 24, 1973, Ser. No. 409,131
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 K



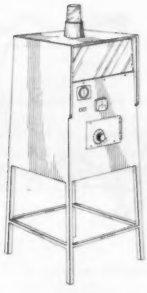
237,635
GAME PIECE
Russell W. Martin, Jr., 45 Van Kirk Road, Princeton, N.J. 08540
Filed Sept. 13, 1973, Ser. No. 396,735
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 DT

237,636
HOCKEY STICK
Raymond W. Leclerc, Leominster, Mass. (% Mylec Inc., Winchendon Springs, Mass. 01475)
Filed Aug. 5, 1974, Ser. No. 494,561
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 BC

237,637
SHIELD FOR PINSETTING MECHANISM ON BOWLING LANE
William Bard, 4700 W. 103rd St., Oak Lawn, Ill. 60453
Filed Aug. 16, 1973, Ser. No. 388,759
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D34—5 DD

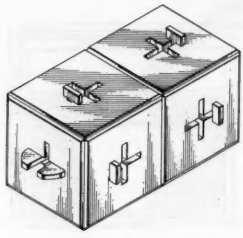


237,638
AMUSEMENT GAME CABINET
Joseph V. Kessler, Phoenix, Ariz., assignor of a fractional part interest to Robert J. Walton
Filed Feb. 19, 1974, Ser. No. 443,709
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J



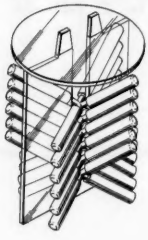
237,639
BLADE GUARD FOR SKATES
Terrance G. Melnechenko, 28 Allenwood Crescent, Willowdale, Ontario, Canada
Filed Apr. 3, 1974, Ser. No. 457,519
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B

237,640
GAME PUZZLE
William H. Baynes, Los Angeles, Calif.
(4122 Greenbush Ave., Sherman Oaks, Calif. 91403)
Filed Feb. 27, 1974, Ser. No. 446,528
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

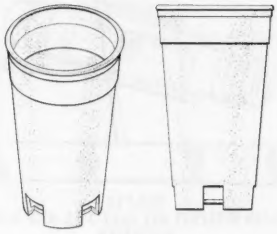


237,641
CYCLE FOR A TOY DOLL
Kosei Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 5, 1974, Ser. No. 458,193
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

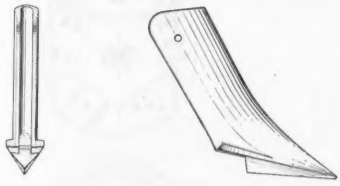
237,642
STACKED JACK GAME PUZZLE
William H. Baynes, Los Angeles, Calif.
(4122 Greenbush Ave., Sherman Oaks, Calif. 91403)
Filed Feb. 27, 1974, Ser. No. 446,526
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



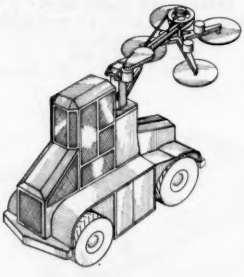
237,643
PLANT RECEPTACLE
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 27, 1974, Ser. No. 537,011
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



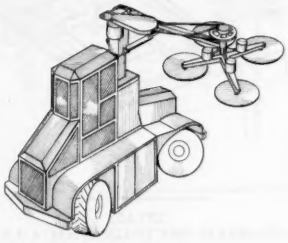
237,644
SUBSOIL APPLICATOR
Donald E. Williams and Forrest E. Robertson, Garden City, Kans., assignors to Acra-Plant, Inc., Newton, Kans.
Filed Sept. 10, 1973, Ser. No. 395,584
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D39—1 R



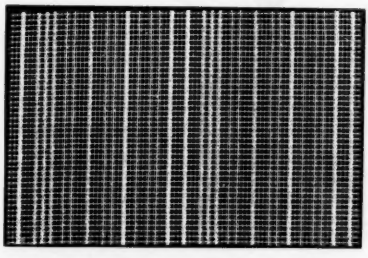
237,645
TREE TOPPER VEHICLE
Kurt P. Pidduck, 772 S. Kimball Road, and Michael E. Capesius, 900 S. Kimball Road, both of Ventura, Calif. 93003
Filed Aug. 31, 1973, Ser. No. 393,415
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



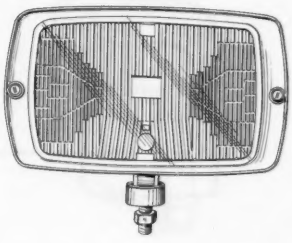
237,646
TREE TOPPER VEHICLE
Kurt P. Pidduck, 772 S. Kimball Road, and Michael E. Capesius, 900 S. Kimball Road, both of Ventura, Calif. 93003
Filed Aug. 31, 1973, Ser. No. 393,416
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



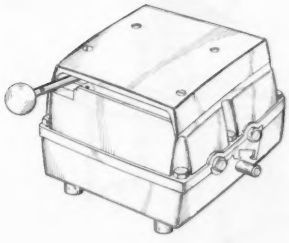
237,647
CURTAIN PATTERN
Peter Eric Schroeder, Oberwil, near Brenngarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 10, 1974, Ser. No. 469,021
Claims priority, application Germany Nov. 12, 1973
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D47—6 E



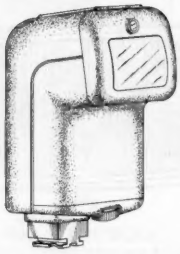
237,648
VEHICLE HEADLIGHT
Pierre Cibie, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Sept. 16, 1974, Ser. No. 506,066
Claims priority, application France July 26, 1974
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



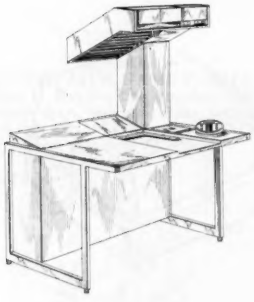
237,649
TRANSMISSION
Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed July 30, 1973, Ser. No. 383,787
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D55—1 G



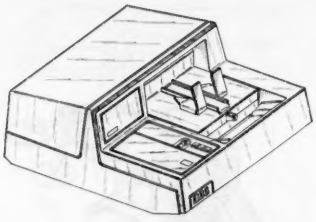
237,650
FLASH UNIT
Roland Ullmann, Hausen, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany
Filed Oct. 23, 1973, Ser. No. 408,625
Claims priority, application Germany May 14, 1973
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 F



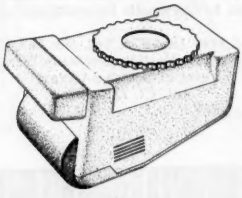
237,651
PLANETARY MICROFILMER OR THE LIKE
Andrew V. McClare, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 1, 1974, Ser. No. 493,571
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



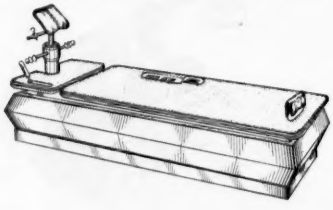
237,652
MICROFILMER OR THE LIKE
Andrew V. McClare, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 30, 1974, Ser. No. 501,949
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



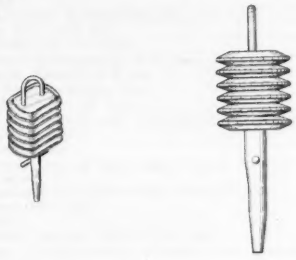
237,653
HAND-HELD HECTOGRAPHIC CARBON DUPLICATOR
Frederic H. Cordner, 1400 Glengarry Road, Pasadena, Calif. 91105
Filed July 1, 1974, Ser. No. 484,666
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 B



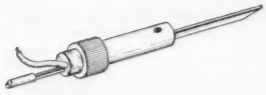
237,654
EXERCISING TABLE
Katsuzo Agatani, 1–3, 3-chome, Naka-yoshino-cho, Tokushima, Japan
Filed Aug. 27, 1973, Ser. No. 391,751
Claims priority, application Japan Mar. 20, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D83—1 S



237,655
ASPIRATOR-IRRIGATOR
Harvey J. Engelsher, Yonkers, N.Y., assignor to Horizons Industries, Ltd., New Rochelle, N.Y.
Filed Jan. 2, 1974, Ser. No. 430,238
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 A



237,656
NEEDLE PROTECTOR FOR DETECTING DEFECTIVE NEEDLE OPERATION ON A KNITTING MACHINE
Robert W. Clemens, Malverne, N.Y., assignor to Wesco Industries Corporation, Plainview, N.Y.
Filed Apr. 12, 1974, Sr. No. 460,474
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Christiaens Societe Anonyme: *See*—
Lapiere, Charles L.; Dejardin, Jean V.; and Mania, Barbara R., 3,919,248.

A. H. Robins Company, Incorporated: *See*—
Greenberg, Jack, 3,918,407.
Thorpe, Richard M., 3,918,668.

A Vuyk & Zonen's Scheepsverven B.V.: *See*—
van der Werff, Bartele, 3,918,381.

AB Sundsvalls Specialprodukter: *See*—
Hellqvist, Ake O. W., 3,918,106.

Abbott, Clyde H. Rod with wall form sealing and spacing means. 3,918,673, Cl. 249-43.000.

Abbott Laboratories: *See*—
Herrin, Marley Ann; and Short, James Harold, 3,919,414.

Abe, Toshizo: *See*—
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, 3,919,185.

Abel, Heinz: *See*—
Berger, Alfred; and Abel, Heinz, 3,919,283.

Abens, Sandors G., to Honeywell Inc. Electric current-producing cells. 3,918,988, Cl. 136-6.0LN.

Abernethy, Charles N., III; and Iannini, Americo A., to United States of America, Transportation. Visual divided attention alcohol safety interlock system. 3,918,176, Cl. 35-22.00R.

Abex Corporation: *See*—
Benson, William J., 3,918,848.

Abrahams, Louis, to Waters Associates. Novel gasket and valve comprising same. 3,918,495, Cl. 137-625.480.

Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., to Westinghouse Electric Corporation. Flowmeter computer. 3,918,304, Cl. 73-194.00A.

Acampora, Vincent Paul; and Powell, David Barton, to General Electric Company. Accessory apparatus for tripping an electric circuit breaker. 3,919,674, Cl. 335-20.000.

Acda, Petrus Marinus, to Polva Nederland B.V. Branch connection for thermoplastic pipe. 3,918,748, Cl. 285-21.000.

Acevedo, Generoso; and Jhatakia, Ashok Chadrakant, to International Telephone and Telegraph Corporation. Ring control circuit. 3,919,488, Cl. 179-18.0HB.

ACF Industries, Incorporated: *See*—
Campbell, George C.; Hammonds, James C.; and Rollins, Dallas W., 3,918,370.

Acme-Cleveland Corporation: *See*—
Jameson, Chester E., 3,918,696.

Acton, Edward M.; Lerom, Michael W.; and Stone, Herbert, to Stanford Research Institute. 1,4-Cyclohexadiene-1-carboxaldehyde synoxime synthetic sweetening agents. 3,919,318, Cl. 260-566.00A.

Adams, Joseph H. Packaging unit for three dimensional articles and packaging blank for forming the same. 3,918,583, Cl. 206-491.000.

Adderley, Edward; and Schwendener, Derek Kurt, to Electric Power Storage Limited. Electric battery terminal seals. 3,918,993, Cl. 136-135.00S.

Adeola AG: *See*—
Nussbaumer, Thomas, 3,918,349.

Adicoff, Arnold: *See*—
McBride, William R.; Finnegan, William G.; and Adicoff, Arnold, 3,919,012.

Adler, Robert; and Laub, Leonard J., to Zenith Radio Corporation. Optical system for directly detecting spatially recorded signals. 3,919,465, Cl. 178-6.60R.

Adriano, Jose H.: *See*—
Castaneda, Octavio, 3,918,618.

Aerochem Research Labs., Inc.: *See*—
Gould, Robert Kindade, 3,919,397.

Aerojet-General Corporation: *See*—
Oberth, Adolf F.; and Bruenner, Rolf S., 3,919,011.

Aeroquip Corporation: *See*—
Fournier, Paul J. E., 3,918,758.

AG fur Industrielle Elektronik AGIE Losone b. Locarno: *See*—
Ullmann, Werner; Schumacher, Bernd; Marti, Peter; and Vasalli, Caspar, 3,919,516.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Lautier, Dominique Jean; Maeder, Lucien Louis; and Mayer, Pierre Edmund, 3,919,563.

Agfa-Gevaert: *See*—
Mertens, Ludovicus Maria, 3,918,973.

Agfa-Gevaert Aktiengesellschaft: *See*—
Winkler, Alfred; Hennig, Fridolin; and Albrecht, Dieter, 3,919,539.

Agfa-Gevaert N.V.: *See*—
Evens, Georges Gerard; and Smets, Georges Joseph, 3,918,972.

Aiphone Kabushiki Kaisha: *See*—
Ichikawa, Shigemasa, 3,919,490.

Airco, Inc.: *See*—
Austin, William E., 3,919,162.
Marancik, William G.; and Ormand, Frederick T., 3,918,998.

Aizawa, Tatsuo: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.

Ajinomoto Co., Inc.: *See*—
Toyoshima, Shigeshi; Kanao, Seizo; Toyoda, Takeshi; and Suyama, Tadashi, 3,919,291.

Akane, Takahiro: *See*—
Kida, Kihachi; Akane, Takahiro; Hosoe, Satosi; and Sugita, Tadashi, 3,918,326.

Akazawa, Tadashi: *See*—
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,919,361.

Ake Sundequist Konsult AB: *See*—
Sundequist, Ake, 3,918,224.

AKG Akustische u. Kino Gerate G.m.b.H.: *See*—
Cech, Karl; and Reinthaler, Karl, 3,919,501.

Akgulian, Sahag C.: *See*—
Haffner, Donald G.; Meyer, Dean A.; Ecker, Franklin A.; and Akgulian, Sahag C., 3,918,240.

Aktiebolaget Electrolux: *See*—
Gulich, Tore; and Stigmark, Lennaet, 3,919,687.

Aktiengesellschaft "Weser": *See*—
Harms, Horst; and Kunsch, Hans-Jurgen, 3,918,653.
Jobst, Wilhelm, 3,918,387.

Akzona Incorporated: *See*—
Siegel, Frederick P., 3,919,430.

Al Nema, Mudhafar A.; and Koepsel, Wellington W., to Kansas State University Research Foundation, The. Commutation chopper circuit with independent trigger. 3,919,622, Cl. 321-45.00C.

Alar Engineering Corporation: *See*—
Doncer, Alexander J.; and White, Harold R., 3,919,088.

Albany International Corporation: *See*—
Coplan, Myron J., 3,918,455.
Nicholson, Charles B., 3,918,774.

Alberny, Robert; and Leclercq, Alain, to Institut de Recherches de la Siderurgie Francaise. Apparatus for the cooling of a continuously cast product. 3,918,467, Cl. 134-64.000.

Alberti, Luigi. Multiple woodwork ing machine and method. 3,918,825, Cl. 408-43.000.

Albrecht, Dieter: *See*—
Winkler, Alfred; Hennig, Fridolin; and Albrecht, Dieter, 3,919,539.

Albright & Wilson Limited: *See*—
Hands, Clifford Henry George, deceased; Hands, Joan, legal representative; and Watson, Donald, legal representative, 3,919,054.

Alcan Aluminum Corporation: *See*—
Englund, James A.; and Buck, Basil H., 3,918,513.

Alderman, Michael L.: *See*—
Levy, Jerome F.; Alps, Hugo A.; Alderman, Michael L.; and Templer, David A., 3,919,451.

Aldred, Edward John; and Kowalski, Julian, to Ransomes Sims & Jefferies Limited. Lawn mowers. 3,918,239, Cl. 56-7.000.

Aldrich, Robert G., to Syracuse University Research Corporation. Chemical comminution of coal and removal of ash including sulfur in inorganic form therefrom. 3,918,761, Cl. 299-5.000.

Alimanestianu, Mihai; and Alimanestianu, Nicholas M., to Alimanestianu, Mihai. Transport system. 3,918,367, Cl. 104-88.000.

Alimanestianu, Mihai; and Alimanestianu, Nicholas M., to Alimanestianu, Mihai. Railroad type switch. 3,918,665, Cl. 246-415.000.

Alimanestianu, Nicholas M.: *See*—
Alimanestianu, Mihai; and Alimanestianu, Nicholas M., 3,918,367.
Alimanestianu, Mihai; and Alimanestianu, Nicholas M., 3,918,665.

Aliotta, Paul. Door frame protector. 3,918,207, Cl. 49-462.000.

Allaben, Charles M.: *See*—
Zimmer, George A.; Allaben, Charles M.; and Weidman, William K., 3,918,776.

Allard, Pierre, to Rhone-Poulenc-Textile. Arylene-bis(phenylenephosphinic acid)-4,4'-di-carboxamide polymers. 3,919,170, Cl. 260-47.0CB.

Allen, Floyd, to United States of America, Army. Low cost telemeter for monitoring a battery and DC voltage converter power supply. 3,919,642, Cl. 325-113.000.

Allen, Gerald F. Conductivity measuring method and apparatus utilizing coaxial electrode cells. 3,919,627, Cl. 324-30.00R.

Allen Group, Inc., The: *See*—
Hull, Donald A., 3,918,171.

Allen, Robert J., to Ex-Cell-O Corporation. Method of and machine for forming, filling and closing containers. 3,918,236, Cl. 53-29.000.

Allen, Robert P.; and Holmes, Jerry D., to Eastman Kodak Company. Production of 2,2-disubstituted propiolactones. 3,919,255, Cl. 260-343.900.

Alley, David W. Seal for repair of a shaft or the like. 3,918,724, Cl. 277-9.000.

Allied Chemical Corporation: *See—*
Formaini, Robert L.; and Little, Edwin D., 3,919,144.
Hyba, Raymond Theodore, 3,918,157.
Kurtz, Bruce E., 3,919,336.
Levasseur, Dornis, 3,919,508.
Segal, Leon, 3,919,386.

Allington, Robert W., to Instrumentation Specialties Company. Optical system. 3,918,811, Cl. 356-51.000.

Allis-Chalmers Corporation: *See—*
Haupt, Robert C., 3,918,540.
Krieger, Gregory A., 3,918,541.
Rouch, Keith E., 3,918,770.
Schoffmann, Rudolf, 3,918,514.
Wagner, Robert J., 3,918,527.
Weltmer, Wilton W., 3,918,491.
Whitaker, Orion C., 3,918,893.
Zach, George O., Jr., 3,918,560.

Allison, Arthur F., to Cutler-Hammer, Inc. Multiple D.C. permanent magnet motor drive for belt type conveyors. 3,918,574, Cl. 198-203.000.

Allison, Joseph M., to General Systems. Constant voltage power supply. 3,919,616, Cl. 320-35.000.

Alliston, William H., to Westinghouse Electric Corporation. Nuclear power plant training simulator modeling organization and method. 3,919,720, Cl. 444-1.000.

Allmand, Thomas R. Fire hose cabinet. 3,918,782, Cl. 312-204.000.

Alphamedics Mfg. Corporation: *See—*
Catarious, Joseph; and Clements, Lawrence, 3,918,854.

Alps, Hugo A.: *See—*
Levy, Jerome F.; Alps, Hugo A.; Alderman, Michael L.; and Templer, David A., 3,919,451.

Altgelt, Klaus H., to Chevron Research Company. Cutting oil of reduced stray fog. 3,919,098, Cl. 252-59.000.

Aluminum Company of America: *See—*
Clawson, Robert G.; and Willis, Wilburn C., 3,918,378.
Willis, Wilburn C., 3,918,610.

Alwitt, Robert S.; and Ross, Sidney D., to Sprague Electric Company. Electrolytic capacitor having an intergrated spacer system. 3,919,604, Cl. 317-230.000.

ALZA Corporation: *See—*
Hoff, Seymour; Kehr, Sharon A.; and Pharriss, Bruce B., 3,918,444.

Ambrosiano, Nicholas A.: *See—*
Crounse, Nathan N.; and Ambrosiano, Nicholas A., 3,919,235.

American Air Filter Company, Inc.: *See—*
Kline, Richard L., 3,918,938.

American Can Company: *See—*
Blakeslee, Harry Nelson, 3,918,401.
Meyers, George L., 3,918,630.

American Filtrona Corporation: *See—*
Holden, Herbert K., 3,919,369.

American Home Products Corporation: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,919,211.
Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., 3,919,302.

American Pulverizer Company: *See—*
Miller, Donald G., 3,918,649.

American Standard Company: *See—*
Florian, Nathaniel, 3,918,666.

American Thermo-Seal, Inc.: *See—*
Cantillo, Enrique J.; Tabata, John D.; and Tabata, Frank M., 3,918,110.

Amor, Leonel da Fonseca, to Schield, Ike. Pollution control device. 3,918,423, Cl. 123-122.0AC.

AMP Incorporated: *See—*
Hays, Kenneth Scott, 3,918,787.
Lemke, Timothy Allen; and Vogel, Jay Forrest, 3,918,784.

Amsler, Bruno, to Braschler & Cie. Apparatus for blending rovings. 3,918,127, Cl. 19-243.000.

Amtsberg, Lester A., to Chicago Pneumatic Tool Company. Hydraulic rock drill having automatic carriage feed. 3,918,531, Cl. 173-10.000.

Amtsberg, Lester A., to Chicago Pneumatic Tool Company. Hydraulic tool. 3,918,532, Cl. 173-105.000.

Andco Incorporated: *See—*
Fritz, Jack J.; and Lucas, Theodore W., Jr., 3,918,373.

Anderson, Elmer L.; and Hillman, Thomas F., to Corning Glass Works. Article trimming apparatus. 3,918,871, Cl. 425-292.000.

Anderson, Elvin L.; and Graboyes, Harold, to SmithKline Corporation. Intermediates for preparing acridines. 3,919,312, Cl. 260-554.000.

Anderson, George A., to Honeywell Inc. Associative interface for single bus communication system. 3,919,693, Cl. 340-172.500.

Anderson, John T.; and Aula, Howard A., to Ford Motor Company. Integrally cast quick heat intake manifold. 3,918,424, Cl. 123-122.0AC.

Anderson, Norman C. Method for making metal-to-ceramic seals. 3,918,922, Cl. 29-182.300.

Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Synthesis of the pink bollworm sex pheromone. 3,919,329, Cl. 260-615.00A.

Anderson, Robert F.: *See—*
Sobel, Jay E.; and Anderson, Robert F., 3,919,343.

Andersson, Oswald Karl Gustav: *See—*
Lundstrom, Goran Ingemar; and Andersson, Oswald Karl Gustav, 3,918,656.

Andreades, Sam; and Baird, Richard L., to Du Pont de Nemours, E. I., and Company. Copolymers or cyclopropenes with polymerizable ethylenic compounds. 3,919,227, Cl. 260-85.50R.

Andres, Rudolf; and Knoll, Heinz W., to Daimler-Benz Aktiengesellschaft. Motor vehicles with a retaining system for the passengers. 3,918,545, Cl. 180-82.00C.

Andrews, Lawrence F., to Andrews, Lawrence F. Orthodontic appliance force equalizer. 3,918,159, Cl. 32-14.00D.

Andrushkevich, Mikhail Mikhailovich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Annen, Klaus: *See—*
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.

Anstett, Raymond Michael; Buck, Charles Edward; and Sheaffer, Victor Earl, to Colgate-Palmolive Company. Carpet cleaning composition and method. 3,919,101, Cl. 252-90.000.

Anthony, James, to Fuller Company. Relief mechanism for jaw crusher. 3,918,648, Cl. 241-32.000.

Anthony, Michael P.: *See—*
Schinella, Richard D.; and Anthony, Michael P., 3,919,005.

Anzai, Masayasu, to Hitachi, Ltd. Color xerographic recording method. 3,918,970, Cl. 96-1.200.

Appel, Horst; Bohm, Klaus; and Gleissner, Gerhard, to Siemens Aktiengesellschaft. Current arrangement for correcting the measured voltage of an analog speed transducer. 3,919,634, Cl. 324-163.000.

Applied Aluminum Research Corporation: *See—*
Toth, Charles, 3,918,960.

Aquila, Werner: *See—*
Himmele, Walter; Hoffmann, Werner; Pasedach, Heinrich; and Aquila, Werner, 3,919,324.

Arai, Atsuaki; Okazaki, Masaki; Hibino, Noburo; and Seto, Kunihira, to Fuji Photo Film Co., Ltd. Polyester film with anthroquinone dye for a photographic film support. 3,918,976, Cl. 96-84.00R.

Arbter, Conrad. Folding machine for soft goods. 3,918,699, Cl. 270-69.000.

Archer, Wesley L.: *See—*
Hall, Richard H.; Haigh, Daniel H.; Archer, Wesley L.; and West, Peter, 3,919,335.

Archibald, John Leheup: *See—*
Cavalla, John Frederick; and Archibald, John Leheup, 3,919,242.

Ardry, Robert; and Robilliart, Michel, to Societe Anonyme dite: Omnium Financier Aquitaine pour l'Hygiene et la Sante (SANOFI). Method of recovering cytobiotic globulin from skin tissue. 3,919,186, Cl. 260-112.00R.

Ariga, Yoshio: *See—*
Sugiyama, Satoshi; and Ariga, Yoshio, 3,918,704.

Arledge, Kenneth W.: *See—*
Guth, Eugene Daniel; Helgeson, Norman L.; Arledge, Kenneth W.; and Brienza, Anthony R., 3,919,402.

Arlman, Jan Jacob, to U.S. Philips Corporation. Apparatus for performing saturation analyses. 3,918,909, Cl. 23-253.00R.

Armour Pharmaceutical Company: *See—*
Melnick, Joseph L.; and Wallis, Craig, 3,919,044.

Armstrong Cork Company: *See—*
Gaston, Jack E., 3,918,227.

Armstrong, Donald E.; Brown, Stephen V.; and Shaffer, John W., to Sylvania Electric Products Inc. Photoflash lamp. 3,918,883, Cl. 431-93.000.

Arnold, Robert J.; and Gattuso, Marion J., to Universal Oil Products Company. Preparation of N-vinyl substituted amidines. 3,919,225, Cl. 260-251.00R.

Arribat, Paul, to Republic of France, The. New and useful improvements in propergols or propellants. 3,918,365, Cl. 102-101.000.

Arrow-Hart, Inc.: *See—*
Phillips, Bernard L., 3,919,513.

Artos Engineering Company: *See—*
Blaha, Gerald E., 3,918,330.

Arvidsson, Karl Ewald. Method and apparatus for detonating combustible substances at atmospheric pressure. 3,918,879, Cl. 431-8.000.

Asai, Komei; Moriyama, Akio; Tatsuta, Hiroshi; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Liquid crystal display device. 3,919,106, Cl. 252-299.000.

Asai, Schumkichiro; and Kawakatsu, Yasuyuki, to Kao Soap Co., Ltd. Liquid polyamide epoxy resin hardener. 3,919,142, Cl. 260-18.0PN.

Ascher, Dieter, to Karl Neumayer GmbH, Firma. Means for plating stranded cables. 3,919,069, Cl. 204-206.000.

Ashina, Yoshiro; Yamaguchi, Yasumasa; and Fujiwara, Atushi, to Nitto Chemical Industry Co., Ltd.; and Nippon Unitol Co., Ltd. Apparatus for reacting organic compounds and sulfur trioxide. 3,918,917, Cl. 23-283.000.

Ashina, Yoshiro; Narita, Takeshi; and Murata, Hiroshi, to Nippon Unitol Co., Ltd.; and Nitto Chemical Industry Co., Ltd. Method of preparing a highly concentrated solution of a higher secondary alcohol ethoxysulfate and such a concentrated solution. 3,919,125, Cl. 252-551.000.

Ashleman, Francis C., to Boeing Company, The. Throttle-reverser control system for water jet propelled seacraft. 3,918,256, Cl. 60-221.000.

Askew, Anthony B.: *See*—
McIntosh, Robert H.; and Hull, Ezekiel H., 3,919,410.

Aso, Tadashi: *See*—
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Asscher, Meir: *See*—
Vofsi, David; and Asscher, Meir, 3,919,292.

Associated Electrical Industries Limited: *See*—
Banbury, John Randolph, 3,919,550.

Asta-Werke Aktiengesellschaft Chemische Fabrik: *See*—
Rebling, Rolf; Pressler, Klaus; and Potel, Jurgen, 3,919,233.

Atkins, Colin A., to Wilkinson Sword Limited. Shaving devices. 3,918,155, Cl. 30-47.000.

Atlantic Richfield Company: *See*—
Johnson, Carl E.; and Baker, Alan D., 3,919,306.
Reed, Dale H., 3,919,684.
Rosenthal, Rudolph; and Zajacek, John G., 3,919,278.
Rosenthal, Rudolph; and Zajacek, John G., 3,919,279.
Rosenthal, Rudolph; Zajacek, John G.; and O'Toole, James T., 3,919,280.

Atlas Copco Aktiebolag: *See*—
Eklof, Ake Torsten; and Romell, Gunnar Vigg Riss, 3,918,535.
Nyholm, Bengt Viktor, 3,918,530.

Augusta, Samuel A. Optical illusion producing amusement device. 3,918,708, Cl. 272-8.00R.

Aula, Howard A.: *See*—
Anderson, John T.; and Aula, Howard A., 3,918,424.

Aumuller, Rolf: *See*—
Klag, Gunther; Wunderlich, Hermann; Jung, Gerhard; and Aumuller, Rolf, 3,919,334.

Aumuller, Walter: *See*—
Weyer, Rudi; Aumuller, Walter; Hitzel, Volker; and Schmidt, Felix Helmut, 3,919,245.

Ausnit, Steven. Fluid-tight fastener. 3,918,131, Cl. 24-201.00C.

Austin Aeromarine, Inc.: *See*—
Austin, Thomas M., 3,918,382.

Austin, Thomas M., to Austin Aeromarine, Inc. Fixed wing surface effect craft. 3,918,382, Cl. 114-66.50R.

Austin, William E., to Airco, Inc. Catalyst supply and reclamation in cold box core making processes. 3,919,162, Cl. 260-38.000.

Autech Corporation: *See*—
Foster, George B.; and Cullen, Donald L., 3,918,816.

Automatic Liquid Packaging, Inc.: *See*—
Komendowski, Henry, 3,919,374.

Axen, Udo F., to Upjohn Company, The. PGE_3 analogs. 3,919,285, Cl. 260-468.00D.

Ayres, Waldemar A., to Becton, Dickinson and Company. Plasma separator assembly. 3,919,085, Cl. 210-83.000.

B. F. Goodrich Company, The: *See*—
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,919,358.
Morris, Roger E., 3,919,143.

Backman, Rolf, to Handelsbolaget Broderna Backman. Boiler for heating of water and generating of steam. 3,918,410, Cl. 122-271.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,919,282.
Hagen, Helmut; and Hansen, Guenter, 3,919,188.
Himmele, Walter; Hoffmann, Werner; Pasedach, Heinrich; and Aquila, Werner, 3,919,324.
Merkle, Hans Rupert; and Siegel, Hardo, 3,919,261.
Schuhmacher, Alfred; Hiller, Heinrich; and Redeker, Joerg, 3,919,303.

Baer, John S. Force overload warning device. 3,918,301, Cl. 73-141.00A.

Bagnoli, Donald L.; and Ciuffreda, Anthony R., to Exxon Research and Engineering Company. Heat resistant alloy for carburization resistance. 3,919,073, Cl. 208-47.000.

Bahramian, Bahram. Prefabricated modular flooring and roofing system. 3,918,222, Cl. 52-227.000.

Bailey, Denis M., to Sterling Drug Inc. Herbicidal compositions containing halomethyl ketones and method of use thereof. 3,918,954, Cl. 71-95.000.

Bailey Meter Company: *See*—
Larsen, Richard R., 3,918,622.

Bailey, Vernon. Wave and tide motor. 3,918,261, Cl. 60-506.000.

Bailey, Wayne. Means and methods of compressing atmospheric air and producing power and vehicular propellants therefrom. 3,918,844, Cl. 417-229.000.

Baillet, Gerard Eugene, to Societe Anonyme de Telecommunications. Device for amplifying the alternating component of a variable signal having a continuous component. 3,919,659, Cl. 330-86.000.

Baird, Richard L.: *See*—
Andreades, Sam; and Baird, Richard L., 3,919,227.

Baker, Alan D.: *See*—
Johnson, Carl E.; and Baker, Alan D., 3,919,306.

Baker, Don R., to Stauffer Chemical Company. Methods of killing insects and mites using certain phosphorus containing organotin compounds. 3,919,418, Cl. 424-216.000.

Baker, Donald H.; and Bowe, Larry J., to Sperry Rand Corporation. Radio navigation system. 3,919,529, Cl. 235-150.270.

Baker, John W. Clamp for precision cutting tool. 3,918,695, Cl. 269-87.200.

Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich. Process for producing 2,4-toluylenediisocyanate dimer. 3,919,195, Cl. 260-239.00A.

Baldino, James P.; and Feltzin, Joseph, to ICI United States Inc. Urethane-modified polyisocyanurate foams. 3,919,128, Cl. 260-2.5AW.

Baldwin, Francis P.: *See*—
Malatesta, Alberto; and Baldwin, Francis P., 3,919,131.

Baldwin, James French; and Maxwell, Douglas H., to Sorcery Metals, Inc. Nickel-base alloys having a low coefficient of thermal expansion. 3,918,964, Cl. 75-171.000.

Ball Corporation: *See*—
Scholes, Addison B.; and Semans, Bruce F., 3,919,391.

Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna. Method for preparing shock-resistant grafted copolymers of styrene or vinyltoluene with synthetic rubber. 3,919,355, Cl. 260-880.00R.

Bamberger, Carlos E.: *See*—
Grimes, Warren R.; and Bamberger, Carlos E., 3,919,406.

Banbury, John Randolph, to Associated Electrical Industries Limited. Scanning electron microscopes. 3,919,550, Cl. 250-311.000.

Bangs, Joseph F. Electrode holder for EDM. 3,919,515, Cl. 219-69.00E.

Banner Metals Division Intercole Automation, Inc.: *See*—
Wilson, James D., 3,918,368.

Bar-on, Ari, to Xerox Corporation. Apparatus for applying release material to a contact fuser roll member utilized in fixing toner images to support sheets. 3,918,804, Cl. 355-3.00R.

Baraona, John P.: *See*—
Mandula, Joseph M.; Baraona, John P.; and Mates, Chester J., 3,919,628.

Barber, Duane G., to Beckman Instruments, Inc. Holder for sample containers of different sizes. 3,918,920, Cl. 23-292.000.

Barch, Herbert W.: *See*—
Holloway, John G.; and Barch, Herbert W., 3,918,936.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,937.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,943.
Holloway, John G.; and Barch, Herbert W., 3,918,945.

Bardon Research and Development Limited: *See*—
Pickard, Bernard H., 3,919,520.

Barer, Sol J. Chlorinated barbituric acids. 3,919,232, Cl. 260-257.000.

Barfoed, Sven: *See*—
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,919,127.

Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., to Shell Oil Company. 2,6 Dihalobenzyl ethers. 3,919,252, Cl. 260-340.900.

Barker, Michael D.: *See*—
Isaac, Eirlys R.; and Barker, Michael D., 3,919,251.

Barker, Sidney Alan; and Kennedy, John Frederick, to Ranks Hovis McDougall Limited. Water insoluble antibiotic metal cellulose compounds and process of preparation. 3,919,190, Cl. 260-210.0AB.

Barlow, Fred D., Jr.; and Moriarty, Joseph A., to Eastman Kodak Company. Process for reacting solid particulate matter with a gas. 3,919,307, Cl. 260-541.000.

Barnes Drill Co.: *See*—
Zoiss, Melvin Howard, 3,918,218.

Barnes, Russell J., to Brunswick Corporation. Electrically controlled shift mechanism for marine propulsion units. 3,919,510, Cl. 200-61.880.

Barooshian, Charles T.: *See*—
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 3,919,462.

Barraclough, Lindsay Ralph. Pack-bed. 3,918,109, Cl. 5-113.000.

Barradas, George. Hair curling equipment. 3,918,465, Cl. 132-37.00R.

Barton, Troyce D., to Texas Instruments Incorporated. DC-DC Converter in watch system. 3,919,625, Cl. 323-17.000.

BASF Aktiengesellschaft: *See*—
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.
Hamprecht, Gerhard, 3,919,308.

Basic Incorporated: *See*—
Borland, Walter G., 3,919,492.

Bassett, Kirk W. Core chucks. 3,918,652, Cl. 242-46.400.

Batiuk, Martin; Herman, Richard M.; and Healy, James C., to B. F. Goodrich Company, The. Thermoplastic polymer blends of (1) EPDM having a high degree of unstretched crystallinity with (2) polyethylene. 3,919,358, Cl. 260-897.00A.

Battelle Development Corporation, The: *See*—
Walker, Ray A., 3,919,697.

Battelle Memorial Institute: *See*—
Fresnel, Jean Marie; and Trosset, Daniele, 3,919,052.

Bauer, Hans F.: *See—*
Robinson, Leon; and Bauer, Hans F., 3,919,118.
Bauhofer, Friedrich, to Vockenhuber, Karl; and Hauser, Raimund, a part interest to each. Playback devices. 3,918,801, Cl. 352-72.000.
Baum, Jesse J. Reduction method. 3,918,956, Cl. 75-3.000.
Baxter Laboratories, Inc.: *See—*
Leonard, Ronald J., 3,918,453.
Bayer Aktiengesellschaft: *See—*
Kirschnek, Helmut; and Gorlich, Hans, 3,919,270.
Klag, Gunther; Wunderlich, Hermann; Jung, Gerhard; and Aumuller, Rolf, 3,919,334.
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,918,953.
Leverenz, Klaus; and Schundehutte, Karl-Heinz, 3,919,214.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,919,246.
Roesky, Herbert Walter; Niederprum, Hans; and Wechsberg, Manfred, 3,919,301.
Schabacher, Werner; Rohe, Hermann; Keller, Wolfgang; and Spreckelmeyer, Bernhard, 3,919,399.
von Gizycki, Ulrich; Oertel, Gunter; Beck, Guenther; and Findeisen, Kurt, 3,919,228.
Wechsberg, Manfred; and Niederprum, Hans, 3,919,295.
Wollweber, Hartmund; and Flucke, Winfried, 3,919,315.
Bayvet Corporation: *See—*
Glass, Max E.; Donahue, Stephen F.; Urton, John T.; and Carlson, Arthur, Jr., 3,919,411.
BBC Brown Boveri & Company Limited: *See—*
Floessel, Carl Dieter, 3,919,456.
Ross, John S. H., 3,919,571.
Beall, Glenn Lee; and White, Fred K., to Miles Laboratories, Inc. Transport swab tube. 3,918,435, Cl. 128-2.00W.
Beatrice Foods Co.: *See—*
Spear, Harry Warren, 3,918,278.
Beatrice Foods Co., -Elgin Molded Plastics Div.: *See—*
Lindner, Henry; and Kennedy, James D., 3,918,795.
Bebech, Michael J. Rapid settler apparatus. 3,919,084, Cl. 210-73.000.
Beck, Guenther: *See—*
von Gizycki, Ulrich; Oertel, Gunter; Beck, Guenther; and Findeisen, Kurt, 3,919,228.
Beck, Henry Nelson, to Dow Chemical Company, The. Hydrothermal process for preparation of alpha iron oxide crystals. 3,919,404, Cl. 423-633.000.
Becker, William Gene; Bruder, Frank Joseph; and Howett, Michael John, to Bourns, Inc. Multiple push-button switching assembly with actuator latch and interlocking structure. 3,919,505, Cl. 200-5.00R.
Beckett, Garner A.: *See—*
Bellew, Lawrence, 3,918,862.
Beckman Instruments, Inc.: *See—*
Barber, Duane G., 3,918,920.
Stephens, Donald E., 3,918,907.
Becton, Dickinson and Company: *See—*
Ayres, Waldemar A., 3,919,085.
Bedner, Michael P., to Shire, Bernard S.; Bergstein, Jack L.; Bialon, Franklin L.; and Hazelbaker, Harold J. Gate valve device. 3,918,471, Cl. 137-238.000.
Bednov, Stanislav Fedorovich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.
Beecham Group Limited: *See—*
Butterworth, Denis; and Rolinson, George Newbolt, 3,919,415.
Ferres, Harry; and Clayton, John Peter, 3,919,196.
Beecher, William J. Binocular with focusing mechanism. 3,918,792, Cl. 350-76.000.
Beeferman, Dennis: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 3,919,442.
Beer, Palle-Finn. Electroacoustic transducer. 3,919,498, Cl. 179-115.5PV.
Belden, Lorne H., Jr., to General Electric Company. Microwave detection instrument. 3,919,638, Cl. 324-95.000.
Bell, Stanley C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,919,211.
Bell Telephone Laboratories, Incorporated: *See—*
Berglund, Richard Newman; Chaudhary, Ved Prakash; and Kummer, Richard Edward, 3,919,495.
Beurrier, Henry Richard, 3,919,660.
Daryanani, Gobind Tahilram, 3,919,502.
Earp, Ronald Lee, 3,919,637.
Friedrichsen, Hans Jack; Mahr, Peter Frank; and Schwarz, Alfred Otto, 3,919,503.
Friend, Joseph John, 3,919,658.
Kostelnick, Joseph John, 3,919,673.
Miller, Calvin Max, 3,919,037.
Mohsen, Amr Mohamed; and Sequin, Carlo Heinrich, 3,918,997.
Noll, A. Michael, 3,919,691.
Plourde, James Kevin, 3,919,672.
Schillo, Robert Frederick, 3,919,489.
Schorr, Anthony Joseph, 3,919,585.
Toumani, Rouben, 3,919,654.
Walden, Robert Henry, 3,919,564.
Beller, Herbert R., to N. V. Klippan S.A. Seat belt retractor having inertial device activated by two stimuli. 3,918,658, Cl. 242-107.400.
Bellew, Lawrence, to Beckett, Garner A. Apparatus for forming nut cluster confections and the like. 3,918,862, Cl. 425-114.000.
Bellis, Robert Elliott. Touch sensitive power control system. 3,919,596, Cl. 315-294.000.
Bender, Mark Leslie, to Hughes Tool Company. Rotary percussion earth boring bit. 3,918,538, Cl. 175-410.000.
Bendix Corporation, The: *See—*
O'Connor, Bernard J.; Shaw, Richard, Jr.; and Epstein, Michael, 3,918,309.
Benedict, Robert P., to Westinghouse Electric Corporation. Flow nozzle for flow measurement of an incompressible fluid. 3,918,305, Cl. 73-211.000.
Benerito, Ruth R.: *See—*
Perrier, Dorothy M.; and Benerito, Ruth R., 3,918,899.
Benjamin, Gary L., to R. L. Kuss & Co., Inc. Thermostatic vent valve. 3,918,221, Cl. 52-1.000.
Bennett, Donald R.; and McHard, James A., to Dow Corning Corporation. Method for decreasing the reproductive function of mammals. 3,919,417, Cl. 424-184.000.
Benson, John Terry; and White, Peter Charles, to Mattel, Inc. Apparatus for trapping an appendage on a figure toy. 3,918,195, Cl. 46-1.00R.
Benson, Kenneth Blair, to Goldmark Communications Corporation. System for transferring motion picture films to video recordings, and for changing aspect ratios. 3,919,474, Cl. 178-7.200.
Benson, William J., to Abex Corporation. Fluid pressure energy translating device. 3,918,848, Cl. 417-292.000.
Benvegno, George J.: *See—*
Davies, Ronald F.; and Benvegno, George J., 3,919,121.
Benz, Gottfried: *See—*
Jochum, Peter; and Benz, Gottfried, 3,918,621.
Benz, Mark C., to General Electric Company. Sintered cobalt-rare earth intermetallic product. 3,919,002, Cl. 148-31.570.
Benz, Mark G., to General Electric Company. Sintered cobalt-rare earth intermetallic product. 3,919,003, Cl. 148-31.570.
Benz, Mark G., to General Electric Company. Liquid sintered cobalt-rare earth intermetallic product. 3,919,004, Cl. 148-31.570.
Berg, Horst: *See—*
Reinhold, Norbert; and Berg, Horst, 3,918,316.
Berger, Alfred; and Abel, Heinz, to Ciba-Geigy AG. Sulfate derivatives of polyglycol compounds. 3,919,283, Cl. 260-458.000.
Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede. Novel nitrofuran compounds and therapeutic compositions. 3,919,200, Cl. 260-240.00A.
Berglund, Richard Newman; Chaudhary, Ved Prakash; and Kummer, Richard Edward, to Bell Telephone Laboratories, Incorporated. Feeder distribution interface for rural areas. 3,919,495, Cl. 179-98.000.
Bergstein, Jack L.: *See—*
Bedner, Michael P., 3,918,471.
Berkowitz, Sidney, to FMC Corporation. Trichloroisocyanuric acid stabilized with hydrated sodium dichloroisocyanurate. 3,919,103, Cl. 252-187.00C.
Bernard, Rodolphe J. Submerged propulsion device. 3,918,388, Cl. 115-22.200.
Berninger, Walter H., to General Electric Company. Gamma camera. 3,919,556, Cl. 250-366.000.
Berninger, Walter H., to General Electric Company. Whole body line scanner. 3,919,557, Cl. 250-366.000.
Bernstein, Albert, to Peritech International Corporation. Gang connector clampable to a communication cable terminal board. 3,918,785, Cl. 339-18.00R.
Berry, Thomas G.; and Fyie, Vincent L., to Ford Motor Company. Induction air temperature control apparatus. 3,918,421, Cl. 123-122.00D.
Bertea Corporation: *See—*
Stevens, Curtis E., 3,919,703.
Bertness, Theodore A.: *See—*
Snavely, Earl S., Jr.; and Bertness, Theodore A., 3,918,521.
Bertva, John T.: *See—*
Dixon, Don P.; and Bertva, John T., 3,918,270.
Best, Carl L. Adjustable full spray nozzle and changes required on impulse sprinklers to accommodate use of nozzle. 3,918,642, Cl. 239-230.000.
Best, Howard S.; Milliman, Bruce A.; and Zak, Edward J., to Corning Glass Works. Tubing severing method. 3,918,216, Cl. 51-283.000.
Bethlehem Steel Corporation: *See—*
Lamb, Thomas H., 3,918,484.
Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Amplifiers with impedance-matched inputs and outputs. 3,919,660, Cl. 330-185.000.
Beyer, Lutz, to U.S. Philips Corporation. Device for extruding permanent magnet bodies. 3,918,867, Cl. 425-174.000.
Bezborodko, Georgy Lazarevich: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.
Bialon, Franklin L.: *See—*
Bedner, Michael P., 3,918,471.

Billottet, Henri: *See*—
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,919,686.

Billow, Kathryn S. Golf club and ball position marker. 3,918,718, Cl. 273-162.00D.

Binasik, Chester S., to Coen Company, Inc. Oil atomizer. 3,918,639, Cl. 239-1.000.

Bingham, Joseph Peter, to RCA Corporation. Automatic peaking apparatus. 3,919,714, Cl. 358-38.000.

Biological Corporation of America: *See*—
Warren, Bert; Crosby, Gordon, Jr.; and Evans, George L., 3,918,905.

Bishop, Daniel G. Play swing apparatus. 3,918,709, Cl. 272-85.000.

Bjorkman, Bengt-Olof, to Morgardshammar Aktiebolag. Rolling stand prestressing system. 3,918,287, Cl. 72-246.000.

Blackwell, Bennie F.; Feltz, Louis V.; and Maydew, Randall C., to United States of America, Energy Research and Development Administration. Wind turbine. 3,918,839, Cl. 416-175.000.

Blaha, Gerald E., to Artos Engineering Company. Insulated wire cutting and stripping apparatus. 3,918,330, Cl. 81-9.510.

Blaine, John C., to Libbey-Owens-Ford Company. Auxiliary operators for slide dampers. 3,918,890, Cl. 432-54.000.

Blake, Walter R., to General Electric Company. Latch device. 3,918,751, Cl. 292-126.000.

Blakeslee, Harry Nelson, to American Can Company. Apparatus for powder coating metal articles. 3,918,401, Cl. 118-630.000.

Blanc & Co.: *See*—
Herbold, Werner R., 3,918,377.

Blattry, Hans: *See*—
Reich, Kurt; and Blattry, Hans, 3,918,352.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See*—
Eibe, Werner W., 3,918,282.

Blincow, Donald W., to Tyco Laboratories, Inc. Apparatus for measurement of tree core density. 3,919,551, Cl. 250-358.000.

Bloch, Herman S., to Universal Oil Products Company. Biodegradable sulfonate detergents. 3,919,299, Cl. 260-503.000.

Bloching, Helmut: *See*—
Kuhling, Dieter; and Bloching, Helmut, 3,919,102.

Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, to U.S. Philips Corporation. Asymmetric aperture corrector for a television image signal. 3,919,470, Cl. 178-7.100.

Blose, Werner, to Schlegel GmbH vormals Weill & Reineke. Fender. 3,918,384, Cl. 114-219.000.

Board of Regents of the University of Nebraska, The: *See*—
Mebus, Charles A., 3,919,412.
Mebus, Charles A., 3,919,413.

Bobel, Robert J., II; Kimura, Robert B.; and Pollex, Robert C., to Libbey-Owens-Ford Company. Method of and apparatus for inspecting the contours of moving bent articles. 3,919,531, Cl. 235-151.300.

BOC Limited: *See*—
Crawley, Stanley; and Taylor, Walter, 3,918,209.

Bock, Gustav: *See*—
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.

Boehringer Mannheim G.m.b.H.: *See*—
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,919,226.

Boeing Company, The: *See*—
Ashleman, Francis C., 3,918,256.
Vircks, Robert M.; and Tisdale, Henry F., 3,918,662.

Bogdanoyic, Borislav, to Studiengesellschaft Kohle mbH. Process for preparing allylidenphosphoranes. 3,919,325, Cl. 260-606.50P.

Bohm, Klaus: *See*—
Appel, Horst; Bohm, Klaus; and Gleissner, Gerhard, 3,919,634.

Bok, Johannes Gerardus; and Witterick, Petrus Johannes Julius, to U.S. Philips Corporation. Arrangement provided with some combustion flash bulbs. 3,918,884, Cl. 431-95.00A.

Bol, Arie; van Ginkel, Johannes; Van Der Schoot, Andrianus Henricus Maria; and Swaanen, Petrus Henricus, to U.S. Philips Corporation. Method of manufacturing a multiple magnetic head. 3,918,151, Cl. 29-603.000.

Bole, Pierre-Andre: *See*—
Eichenberger, Jurg; Perlhefter, Norbert; and Bole, Pierre-Andre, 3,919,222.

Bolger, Bernard J.: *See*—
O'Sullivan, Denis J.; and Bolger, Bernard J., 3,919,083.

Bolton, Edwin C.: *See*—
Reinhart, Fred; and Bolton, Edwin C., 3,919,036.

Bolza, Frederick, to ICI Australia Limited. Gelled water-bearing explosive and process. 3,919,015, Cl. 149-42.000.

Bonecutter, Charles A.: *See*—
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,919,320.

Bonsack, James Paul, to SCM Corporation. Recovering chlorine from ferric chloride vapors. 3,919,400, Cl. 423-502.000.

Boom, Roger W.: *See*—
Young, Warren C.; Boom, Roger W.; and Peterson, Harold A., 3,919,677.

Booth, Albert N.: *See*—
Elliger, Carl A.; Waiss, Anthony C., Jr.; and Booth, Albert N., 3,919,432.

Borchert, Edgar; and Sommer, Karlheinz, to Licentia Patent-Verwaltungs-G.m.b.H. Method for producing an improved thyristor. 3,919,009, Cl. 148-189.000.

Borchert, Edgar; and Sommer, Karlheinz, to Licentia Patent-Verwaltungs-G.m.b.H. Method for producing a semiconductor device which is protected against overvoltage. 3,919,010, Cl. 148-189.000.

Borg-Warner Corporation: *See*—
Boyer, Nicodemus E., 3,919,356.
Hechenbleickner, Ingenuin, 3,919,165.
Zimmer, George A.; Allaben, Charles M.; and Weidman, William K., 3,918,776.

Borisch, Ronald R.: *See*—
Maffei, Hector P.; and Borisch, Ronald R., 3,918,961.

Borland, Walter G., to Basic Incorporated. Solid state interrupter. 3,919,492, Cl. 179-84.00R.

Born, Gunthard, to Messerschmitt-Bolkow-Blohm G.m.b.H. Gas dynamic laser device. 3,919,662, Cl. 331-94.50G.

Born, Maurice: *See*—
Parc, Guy; Born, Maurice; and Rojey, Alexandre, 3,919,075.

Bornholdt, Siegfried, to Rexroth GmbH. Adjustable vane pump. 3,918,855, Cl. 418-24.000.

Bosco, Joseph. Versatile bookmark. 3,918,390, Cl. 116-119.000.

Bose, Ajay K. Process for the preparation of 3-axial hydroxy steroids. 3,919,268, Cl. 260-397.400.

Bossert, Friedrich: *See*—
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,919,246.

Boswell, George A., Jr.; and Brittelli, David R., to Du Pont de Nemours, E. I., and Company. Fluorinated cephalosporins. 3,919,204, Cl. 260-243.00C.

Bottcher, Winfried, to Veb Polygraph Leipzig Kombinat Fuwe Polygraphische Maschinen und Ausruestungen. Method of heat-sealing superimposed layers of sheet material. 3,919,019, Cl. 156-91.000.

Bottoms, Donald J.: *See*—
United States of America, National Aeronautics and Space Administration; Bottoms, Donald J.; and Gavrillis, Theofanis G., 3,919,710.

Bouhon, Pierre Hubert Marie Joseph, to Societe Anonyme des Ateliers Houget Duesberg Busson. Spinning. 3,918,246, Cl. 57-58.910.

Bourdoncle, Bernard; and Sillion, Bernard, to Institut Francaise du Petrole, des Carburants et Lubrifiants. Sulfur-containing compositions of unsaturated esters, their use as additives for lubricants and the lubricating compositions containing them. 3,919,187, Cl. 260-125.000.

Bourgraf, Elroy E.; Dunn, Robert E.; and Self, Kenneth R., to Ferno-Washington, Inc. Crash stable cot fastener. 3,918,554, Cl. 188-32.000.

Bourns, Inc.: *See*—
Becker, William Gene; Bruder, Frank Joseph; and Howett, Michael John, 3,919,505.

Bowbeer, Thomas Aisbitt: *See*—
Thompson, Peter Charles; and Bowbeer, Thomas Aisbitt, 3,919,388.

Bowe, Larry J.: *See*—
Baker, Donald H.; and Bowe, Larry J., 3,919,529.

Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., to International Business Machines Corporation. Omnidirectional optical scanner. 3,919,527, Cl. 235-61.11E.

Bowen, James Harold; and Flowers, Edward, to Union Carbide Corporation. Apparatus and method for detecting holes in dielectric sheet materials. 3,919,635, Cl. 324-54.000.

Bowlus, Daniel A.: *See*—
Dugan, Martin F.; and Bowlus, Daniel A., 3,918,859.

Bowman, Thomas C., to Watson-Bowman Associates, Inc. Expansion joint seal. 3,918,824, Cl. 404-64.000.

Bowser, George H.; and Mazzoni, Renato J., to PPG Industries, Inc. Multiple glazed unit. 3,919,023, Cl. 156-107.000.

Boyer, Nicodemus E., to Borg-Warner Corporation. Halogenated norbornene-methanonaphthalene derivatives and their applications. 3,919,356, Cl. 260-891.000.

Brachman, Armand Edward, to GAF Corporation. Fire retardant polyurethanes and polyurea-urethanes having improved processability and color stability. 3,919,166, Cl. 260-45.80A.

Bradshaw, Don L., to Tucker, Grant C. Irrigation system. 3,918,264, Cl. 61-12.000.

Brake Roller Company: *See*—
Isacsson, Sven E., 3,918,561.

Braschler & Cie: *See*—
Amsler, Bruno, 3,918,127.

Bratkowski, Walter V.; and Spewock, Metro, to Westinghouse Electric Corporation. Permanent-magnet type relay. 3,919,676, Cl. 335-179.000.

Braun Aktiengesellschaft: *See*—
Mahlich, Gotthard; and Engelstatter, Heinz, 3,919,594.

Braun, Dieter, to Felren & Guilleaume Kabelwerke Aktiengesellschaft. Molding of synthetic plastic members onto a travelling elongated element. 3,918,864, Cl. 425-129.00R.

Breakey, James W.; Freter, John M.; and Wren, Jack, to Hosmer/Dorrance Corporation. Knee prosthesis. 3,918,103, Cl. 3-22.000.

Brenig, Theodore, to General Electric Company. High voltage measuring device. 3,919,633, Cl. 324-126.000.

Breuer, Hermann: *See*—
Treuner, Uwe D.; and Breuer, Hermann, 3,919,205.

Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, to Thomson-Brandt. Method of reducing the optical noise produced by a motion on an illuminated surface, and optical devices for implementing said method. 3,919,698, Cl. 340-173.0LM.

Bridgestone Tire Company Limited: *See—*
Furukawa, Junji; Iseda, Yutaka; Haga, Kazuo; and Irako, Koichi. 3,919,180.
Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro. 3,919,184.

Bridigum, Robert J., to Westinghouse Air Brake Company. Vibration-absorbing support frame for railway vehicle motor-compressor unit. 3,918,850, Cl. 417-363.000.

Brienza, Anthony R.: *See—*
Guth, Eugene Daniel; Helgeson, Norman L.; Arledge, Kenneth W.; and Brienza, Anthony R., 3,919,402.

Brindisi, Frank A., Jr.; Wynschenk, Jo; and Wieczorek, Theophil J., to Enthone, Incorporated. Alkaline etchant compositions. 3,919,100, Cl. 252-79.100.

British Steel Corporation: *See—*
Skelton, Charles Roger; Marshall, Joseph William; Oxlade, Roy Ronald; and Gibson, Keith Cyril, 3,918,302.

British Steel Corporation (Chemicals) Limited: *See—*
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, 3,919,119.

British Titan Limited: *See—*
Thompson, Peter Charles; and Bowbeer, Thomas Aisbitt, 3,919,388.

Brittelli, David R.: *See—*
Boswell, George A., Jr.; and Brittelli, David R., 3,919,204.

Broaddus, Gene C.; and Fredrickson, Sherman E., to Halliburton Company. Fracture acidizing method. 3,918,524, Cl. 166-307.000.

Brookes, Derek John: *See—*
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, 3,919,119.

Brooking, Ivor Harold: *See—*
Poucher, Michael; and Brooking, Ivor Harold, 3,918,837.

Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, to Hoffmann-La Roche Inc. 3-Substituted -5-alkyl-2-cyclohexen-1-ones. 3,919,322, Cl. 260-590.000.

Brouillette, Joseph W.; and Leyshon, William E., to General Electric Company. Hot sub-stage for a scanning electron microscope. 3,919,558, Cl. 250-443.000.

Brown, Alfred W.; and Moran, Richard J., to Owens-Corning Fiberglas Corporation. Method for electrostatically impregnating strand. 3,919,437, Cl. 427-13.000.

Brown, Frank R. Pliers-type wire-crimper. 3,918,472, Cl. 140-106.000.

Brown, Michael Alwyn; and Jangestrand, Gert Harald Leopold, to Mo Och Domsjo Aktiebolag. Process for preparing phosphorus nitrilate polymers. 3,919,364, Cl. 260-973.000.

Brown, Richard. Anti-noise device for the masts of sailing vessels and the like and methods for preventing noise. 3,918,383, Cl. 114-102.000.

Brown, Richard D. Leadless probe. 3,919,631, Cl. 324-51.000.

Brown, Stephen V.: *See—*
Armstrong, Donald E.; Brown, Stephen V.; and Shaffer, John W., 3,918,883.

Brown, Theodore E., Jr.; and Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Process for continuously forming compartmented packages. 3,918,235, Cl. 53-28.000.

Browning Arms Company: *See—*
Hartog, Thomas J., 3,918,189.

Bruckner, Kurt. Apparatus for the wet treatment and subsequent drying of a textile fabric web. 3,918,276, Cl. 68-18.00R.

Bruder, Frank Joseph: *See—*
Becker, William Gene; Bruder, Frank Joseph; and Howett, Michael John, 3,919,505.

Bruenner, Rolf S.: *See—*
Oberth, Adolf F.; and Bruenner, Rolf S., 3,919,011.

Brumagim, Ivan S., to Secondary Processing Systems. Continuous pressure filtering and/or screening apparatus for the separation of liquids and solids. 3,919,087, Cl. 210-350.000.

Brunswick Corporation: *See—*
Barnes, Russell J., 3,919,510.
Horn, Norman E., 3,918,418.

Bryan Donkin Company Limited, The: *See—*
Doe, Ernest Edward; and Cowlishaw, David, 3,918,481.

Bryant, Clyde C. Frictionless brake. 3,918,558, Cl. 192-3.00R.

Brzuskiewicz, John: *See—*
Wright, Charles Donald; Gutfreund, Kurt; and Brzuskiewicz, John, 3,919,719.

Bucherati, Frank: *See—*
Pepper, Roger Thomas; and Bucherati, Frank, 3,918,141.

Buck, Basil H.: *See—*
Englund, James A.; and Buck, Basil H., 3,918,513.

Buck, Charles Edward: *See—*
Anstett, Raymond Michael; Buck, Charles Edward; and Sheaffer, Victor Earl, 3,919,101.

Buck, Robert. Electronic monitoring system with delayed activation. 3,919,661, Cl. 331-65.000.

Bugaut, Andree; and Laudon, Monique, to Societe Anonyme dite: L'Oreal. Diaminobenzoquinones, the method of producing the same and hair dye compositions containing the same. 3,919,265, Cl. 260-396.00R.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 3,918,896.

Bulkley, Clifford T.: *See—*
Moody, Harold W., Jr.; and Bulkley, Clifford T., 3,918,838.

Bundy, Gordon L.; and Pike, John E., to Upjohn Company, The. Prostaglandin A_2 analogs. 3,919,286, Cl. 260-468.00D.

Bundy, William C. Coin and key container. 3,918,503, Cl. 150-35.000.

Bunger, David A., to D. H. Baldwin Company. Automatic chord and rhythm system for electronic organ. 3,918,341, Cl. 84-1.010.

Bunger, Richard E. Process and apparatus for inhibiting generation of ammonia and other noxious gases and the prevention of odor in concentrated feedlot facilities. 3,918,404, Cl. 119-28.000.

Burford, Charles E. Wire tyer for balers. 3,918,358, Cl. 100-19.00R.

Burghardt, Alden M.: *See—*
Nemeth, Bela J.; and Burghardt, Alden M., 3,918,138.

Burkhardt, Charles E.; and Ellis, Belvin B., to Westinghouse Electric Corporation. Method of constructing a magnetic core. 3,918,153, Cl. 29-609.000.

Burkowitz, Peter Klaus, to Polygram GmbH. Method and apparatus for the production of multichannel sound signals. 3,919,477, Cl. 179-1.0GQ.

Burn, Norman: *See—*
Inkster, John S.; and Burn, Norman, 3,918,447.

Burns, Robert A., to Engelhard Minerals & Chemicals Corporation. Thermoplastic vinyl tile products and production thereof. 3,919,159, Cl. 260-31.20R.

Burroughs Corporation: *See—*
Kronies, Reinhard K.; and Coupland, John R., 3,919,692.

Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, to Hill-Rom Company, Inc. Safety light. 3,919,540, Cl. 240-2.00R.

Buschman, Jerome, to McGraw-Edison Company. Vibrating sander. 3,918,214, Cl. 51-170.00R.

Buser, Martin: *See—*
Sigdell, Jan-Erik; and Buser, Martin, 3,919,455.

Bushin, Alexandr Nikitich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Bussell, George W., to Inmont Corporation. Corrosion resistant coated metal. 3,919,453, Cl. 428-336.000.

Butler, Calvin J. Combination container with disposable closure and linear assembly. 3,918,605, Cl. 220-63.00R.

Buttaravoli, Philip M., to E-Med Corporation. Securement device for intravenous catheter and its tubing. 3,918,446, Cl. 128-133.000.

Butterworth, Denis; and Rolinson, George Newbolt, to Beecham Group Limited. Substance MM 4550 and process for producing same. 3,919,415, Cl. 424-115.000.

Buttle, Robert Leroy: *See—*
Hart, Lewis Frederick; and Buttle, Robert Leroy, 3,918,982.

Buyanov, Roman Alexeevich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Byers, James Otto, Jr., to Tomco, Inc. Three axes hydraulic remote control valve. 3,918,496, Cl. 137-636.100.

Bynum, Byron G., to Texas Instruments Incorporated. Differentiator and variable threshold gate circuit. 3,919,537, Cl. 235-183.000.

C.A.V. Limited: *See—*
Phillips, Ronald, 3,918,318.

C. Kondo & Co., Ltd.: *See—*
Nishiwaki, Fukujiro; and Yoshino, Tomii, 3,918,376.

Cailloux, Paul, to Promecam-Sisson-Lehmann. Rocking action shearing apparatus with a pivot axis for the movable blade inclined to the cutting edge of the stationary blade. 3,918,339, Cl. 83-611.000.

Calamari, Timothy A., Jr.: *See—*
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., 3,919,439.

California Institute of Technology: *See—*
Rhein, Robert A.; and Ingham, John D., 3,919,172.

Cammarota, David F.: *See—*
Torn, Lawrence J.; and Cammarota, David F., 3,918,672.

Campbell, George C.; Hammonds, James C.; and Rollins, Dallas W., to ACF Industries, Incorporated. Through sill for railway cars. 3,918,370, Cl. 105-416.000.

Campbell, Robert W., to Phillips Petroleum Company. P-phenylene sulfide polymers. 3,919,177, Cl. 260-79.100.

Canon Kabushiki Kaisha: *See—*
Nakamura, Zenzo, 3,919,593.
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 3,918,802.
Takano, Eiichi, 3,918,797.
Takano, Eiichi, 3,918,798.

Cantaloupe, Francis A.; Frost, Rodney I.; and Holleran, Louis M., to Corning Glass Works. Method for extruding thin-walled honeycombed structures. 3,919,384, Cl. 264-177.00R.

Canter, James A., to General Motors Corporation. Ice-maker control circuit with slab limiting control. 3,918,267, Cl. 62-138.000.

Cantillo, Enrique J.; Tabata, John D.; and Tabata, Frank M., to American Thermo-Seal, Inc. Water beds and method of making the same. 3,918,110, Cl. 5-348.0WB.

Capshew, Ruth E. Arithmetic fact teaching device. 3,918,177, Cl. 35-31.00R.

Carco, Inc.: *See—*
Peterson, Rudolph G., 3,918,609.

Carini, Piertommaso, to Dow Chemical Company, The. Joining plastic elements. 3,919,034, Cl. 156-304.000.

Carl Zeiss Stiftung: *See—*
Schmidt, Werner, 3,919,665.

Carlson, Arthur, Jr.: *See—*
Glass, Max E.; Donahue, Stephen F.; Urton, John T.; and Carlson, Arthur, Jr., 3,919,411.

Carlson, Leon E.: *See—*
Scammon, Lawrence W., Jr.; and Carlson, Leon E., 3,918,581.

Carlson, Lloyd; and Schmitt, Robert A., to Columbia Machine, Inc. Article positioning apparatus. 3,918,575, Cl. 198-284.000.

Carlsson, Sven A., to Phelps Dodge Industries, Inc. Sectional stud for modular wall section. 3,918,223, Cl. 52-221.000.

Carrasse, Jean; Gerard, Jacques; Pounhet, Pierre; and Martin, Therese, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Gas heat exchanger unit. 3,918,516, Cl. 165-5.000.

Carraz, Gilbert; Pigerol, Charles; Jean-Grandremy, Alain; and Eymard, Pierre Luc, to Labaz. Pyrimidine derivatives and process for preparing the same. 3,919,229, Cl. 260-256.40N.

Carroll, Frank E., to Decks, Incorporated. Building deck construction. 3,918,230, Cl. 52-309.000.

Carson, Earl W. Flush valve. 3,918,676, Cl. 251-51.000.

Carson, William N., Jr.; and Niedrach, Leonard W., to General Electric Company. Voltammetric oxygen sensor. 3,919,067, Cl. 204-195.00P.

Carter, James Coolidge. Pump. 3,918,852, Cl. 417-424.000.

Carter, Paul M.: *See—*
Tyler, Reginald E. W.; and Carter, Paul M., 3,918,586.

Caruolo, Antonio B.; Davis, Jack W.; and Walch, Allen P., to United Technologies Corporation. Method and apparatus for aligning laser reflective surfaces. 3,919,663, Cl. 331-94.50C.

Casagrande, Fulvio: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,919,331.

Cascade Corporation: *See—*
Gaibler, Dennis W.; and Olson, John E., 3,918,742.
Olson, John E.; and Gaibler, Dennis W., 3,918,741.

Cassella Farbewerke Mainkur Aktiengesellschaft: *See—*
Hintermeier, Karl; Trosken, Otto; and Wirth, Siegfried, 3,919,319.

Castaneda, Jose G.: *See—*
Castaneda, Octavio, 3,918,618.

Castaneda, Octavio, to Lopez, Alicia C.; Castaneda, Jose G.; and Adriano, Jose H., part interest to each. Shot holder. 3,918,618, Cl. 224-45.00L.

Castelnuovo, Lucio; and Mattiussi, Andrea, to Montecatini Edison S.p.A. Impact resistant polyesters comprising a crosslinked rubbery polymer. 3,919,353, Cl. 260-873.000.

Castic, William A., to North Star Lighting Inc. Floodlight assembly with improved lens frame. 3,919,542, Cl. 240-41.550.

Castles, George Richard: *See—*
Ettre, Kitty S.; Castles, George Richard; and Petrikas, Aloyzas, 3,919,452.

Catarious, Joseph; and Clements, Lawrence, to Alphamedics Mfg. Corporation. Peristaltic pump. 3,918,854, Cl. 417-477.000.

Caterpillar Tractor Company: *See—*
Habiger, Cyril W.; and Hopkins, Donald L., 3,918,259.
Junck, John A.; and Johnson, Howard L., 3,918,847.
Silverstone, Calvin Eric; and Noble, David Stanley, 3,918,517.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 1-(Benzodioxanylalkylene)piperidines. 3,919,242, Cl. 260-293.580.

Ceccaroni, Luciano. Frequency responsive light target. 3,918,714, Cl. 273-101.100.

Cech, Karl; and Reinthaler, Karl, to AKG Akustische u. Kino Gerate G.m.b.H. Headphone construction. 3,919,501, Cl. 179-156.00R.

Celanese Corporation: *See—*
Riley, Jesse Louis; and White, Howard Ray, Jr., 3,918,247.

Cerefice, Steven A.; and Fields, Ellis K., to Standard Oil Company, The. Diepoxides of 1,2-dihydrophthalate. 3,919,262, Cl. 260-348.00C.

Ceskoslovenska akademie ved: *See—*
Hejno, Karel; Slama, Karel; and Sorm, Frantisek, 3,919,260.

Chamberlin, Robert W. Puppet book structure. 3,918,180, Cl. 35-35.00E.

Champion-Edison, Inc.: *See—*
Hillner, Rudolf E.; Strouse, David, Jr.; and Hoch, Lou, 3,918,655.

Champion International Corporation: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,919,110.

Chandler Evans Inc.: *See—*
Grennan, Charles W., 3,918,831.

Chaney, Don P.; and McClain, James E., to Esco Manufacturing Company. Electrical connector apparatus. 3,918,786, Cl. 339-19.000.

Chang, Hsu; Chen, Tien Chi; and Tung, Chin, to International Business Machines Corporation. Symmetric switching functions using magnetic bubble domains. 3,919,701, Cl. 340-174.0TF.

Chang, Wen-Hsuan; Erikson, J. Alden; and Porter, Samuel, Jr., to PPG Industries, Inc. Composition useful in making extensible films. 3,919,351, Cl. 260-850.000.

Chang, Yun-Feng; Cheung, Mo-Fung; and Labana, Santokh S., to Ford Motor Company. Aqueous coating composition of acrylic polymer latex, acrylic polymer solution and aminoplast and method of making. 3,919,154, Cl. 260-29.4UA.

Chao, Albert A. Screw driver's light. 3,919,541, Cl. 240-6.460.

Chao, Albert L. Mini-electronic blinking compartment. 3,918,184, Cl. 40-52.00R.

Chapman, Charles C., to Phillips Petroleum Company. Propane recovery in HF alkylation utilizing extraction or two-phase condensation for removal of organic fluoride. 3,919,342, Cl. 260-683.420.

Charves, Virginia A. Game apparatus. 3,918,717, Cl. 273-138.00R.

Charvet, Joseph, to Societe Francaise de Tuyaux Metalliques/Flexibles. Method and apparatus for forming flexible corrugated members. 3,918,285, Cl. 72-77.000.

Chaudhary, Ved Prakash: *See—*
Berglund, Richard Newman; Chaudhary, Ved Prakash; and Kummer, Richard Edward, 3,919,495.

Chay, Dong Myung, to Du Pont de Nemours, E. I., and Company. Method of preventing formation of sodium-iron sulfate in the preparation of sodium bisulfate. 3,919,401, Cl. 423-520.000.

Check Mate Systems, Inc.: *See—*
Williams, Allan L.; and Heck, Lyle D., 3,919,704.

Cheeseman, Robert A., to Xerox Corporation. Blade mounting assemblies. 3,918,400, Cl. 118-261.000.

Chemiczna Spoldzielnia pracy "Synteza": *See—*
Zmojdzin, Andrzej; and Hoffman, Boguslaw, 3,919,223.

Chemotronics International, Inc.: *See—*
Rice, Warren A., 3,918,878.

Chemtrust Industries Corporation: *See—*
Lamz, Richard A.; and Schneider, Barry, 3,918,647.

Chen, Tien Chi: *See—*
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 3,919,701.

Cheng, George Chiwo. Color information leukocytes analysis system. 3,919,530, Cl. 235-151.300.

Cheng, Richard C. M.; Dennis, Gene Patrick; and Kircher, Robert Edward, to Consolidated Foods Corporation. Toy vehicle. 3,918,198, Cl. 46-206.000.

Cheresnowsky, Michael: *See—*
Hammond, Michael; and Cheresnowsky, Michael, 3,918,977.

Cheung, Mo-Fung: *See—*
Chang, Yun-Feng; Cheung, Mo-Fung; and Labana, Santokh S., 3,919,154.

Chevron Research Company: *See—*
Altgelt, Klaus H., 3,919,098.
Hess, Patrick H., 3,919,104.
Hutchison, Stanley O., 3,918,520.
Ransley, Derek L., 3,919,339.

Chicago Pneumatic Tool Company: *See—*
Amtsberg, Lester A., 3,918,531.
Amtsberg, Lester A., 3,918,532.
Stout, Emmet E., 3,918,213.

Chicago Rawhide Manufacturing Company: *See—*
Dufresne, Eugene R., 3,919,448.

Chichester, Willard L.; and Holtkamp, Donald A., to Clark Equipment Company. Hydrostatic assist drive for vehicles. 3,918,546, Cl. 180-44.00M.

Childers, Thomas W.: *See—*
Weber, Ronald A.; Griffin, Zane L.; and Childers, Thomas W., 3,918,485.

Childs, George William, deceased: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,919,544.

Childs, Patricia M., executrix: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,919,544.

Chore-Time Equipment, Inc.: *See—*
Hostetler, Eldon, 3,918,405.

Chou, Sunlin, to Intel Corporation. Erasable floating gate device. 3,919,711, Cl. 357-23.000.

Christensen Diamond Products Company: *See—*
Mori, Takeshi, 3,918,210.

Christy, Charles A. Mechanical movement device. 3,918,327, Cl. 74-600.000.

Chugai Electric Co.: *See—*
Shibata, Akira, 3,918,924.

Ciba-Geigy AG: *See—*
Berger, Alfred; and Abel, Heinz, 3,919,283.
Drabek, Jozef, 3,919,362.
Hoster, Hansruedi; and Markert, Jurgen, 3,918,902.
Jager, Horst; and Schafer, Paul, 3,919,183.
Oswald, Alexis A.; and Valint, Paul L., 3,919,129.
Plattner, Eric; Comninellis, Christos; and Javet, Philippe, 3,919,057.
Randell, Donald Richard; and Pickles, Wilfred, 3,919,158.
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,919,331.

Ciba-Geigy Corporation: *See—*
Dazzi, Joachim, 3,919,221.
Eichenberger, Jurg; Perlhefter, Norbert; and Bole, Pierre-Andre, 3,919,222.

Kristinsson, Haukur; and Rufenacht, Kurt, 3,919,244.
Ramey, Chester E.; and Luzzi, John J., 3,919,234.
Rossi, Alberto, 3,919,304.
Woodward, Robert Burns, 3,919,249.

Ciba-Geigy (UK) Limited: *See—*
Richardson, Norman; Jones, Thomas Ivor; and Miles, Peter, 3,919,258.

Ciuffreda, Anthony R.: *See—*
Bagnoli, Donald L.; and Ciuffreda, Anthony R., 3,919,073.

Clarion Company Limited: *See—*
Nonaka, Hiroshi; Usugi, Kikuo; Okada, Masataka; and Iwasaki, Shoji, 3,918,716.

Clark, Bill D.: *See—*
Godfrey, Vern L.; and Clark, Bill D., 3,918,595.

Clark Equipment Company: *See—*
Chichester, Willard L.; and Holtkamp, Donald A., 3,918,546.
Frost, Barry L., 3,918,325.

Clark, Thomas E.: *See—*
Salvati, John G.; Ricci, Louis N.; and Clark, Thomas E., 3,919,603.

Clark, Virgil R.; Goodew, Carroll D.; Kueper, Terrance W.; and Price, Byron H., to International Business Machines Corporation. Overcurrent sense circuit. 3,919,565, Cl. 307-235.00R.

Clarke, Gladys E.; and Clarke, Richard V. Candle stabilizing device. 3,918,888, Cl. 431-297.000.

Clarke, Richard V.: *See—*
Clarke, Gladys E.; and Clarke, Richard V., 3,918,888.

Claussen, Uwe, to Kinzler, Georg. Apparatus for artificial respiration. 3,918,317, Cl. 74-469.000.

Clavey, William F., to Paccar Inc. Method of welding tanks. 3,918,628, Cl. 228-213.000.

Clawson, Robert G.; and Willis, Wilburn C., to Aluminum Company of America. Container closure with vent opening means and method of forming the same. 3,918,378, Cl. 113-121.00C.

Clayton, John Peter: *See—*
Ferres, Harry; and Clayton, John Peter, 3,919,196.

Clements, Alwin S.: *See—*
Metcalfe, Kenneth A.; Clements, Alwin S.; and Horrocks, Brian J., 3,918,966.

Clements, Lawrence: *See—*
Catarious, Joseph; and Clements, Lawrence, 3,918,854.

Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., to Union Carbide Corporation. Biodegradable containers. 3,919,163, Cl. 260-40.00R.

Coast, John B., to Coast Machinery, Inc. High speed machine and method for folding plastic bags and the like. 3,918,698, Cl. 270-69.000.

Coast Machinery, Inc.: *See—*
Coast, John B., 3,918,698.

Coaton, James Richard; and Rees, John Michael, to Thorn Electrical Industries Limited. Tungsten-halogen cycle electric incandescent lamp and method of manufacturing. 3,919,578, Cl. 313-222.000.

Coberley, Daniel A., to Hurletron Altair. Register control scanner assembly and method. 3,919,561, Cl. 250-561.000.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Calculator system having an exchange data memory register. 3,919,532, Cl. 235-156.000.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Precharged digital adder and carry circuit. 3,919,536, Cl. 235-174.000.

Coen Company, Inc.: *See—*
Binasik, Chester S., 3,918,639.

Coffey, Henry F.: *See—*
Stevenson, Charles E.; and Coffey, Henry F., 3,918,913.

Cohen, Arthur L.; Garner, Gerald E.; and Steever, Raymond G. E., Jr., to Research Corporation. Integrated device for controlling charging artifacts in scanning electron microscopes. 3,919,553, Cl. 250-311.000.

Cohen, David A., to Venus Scientific Inc. Ambient light excluding camera adapter with viewing hood. 3,918,810, Cl. 355-18.000.

Cohen, Georges; Gracco, Francis; and Mikitenko, Paul, to Institut Francais du Petrole. Process for separating aromatic hydrocarbons by extractive distillation. 3,919,078, Cl. 208-313.000.

Cohen, Harvey L., to Exxon Research and Engineering Company. Tire tread compositions of improved wet skid resistance. 3,919,130, Cl. 260-4.000.

Cohen, William A.: *See—*
Devaney, Robert P.; Fellner, Erwin J.; and Cohen, William A., 3,918,098.

Colburn, Fred R.: *See—*
Krupp, Myron J.; Colburn, Fred R.; and Knudtson, John P., 3,919,152.

Coleman, Charles E.; and Hammel, Ronald O., to Gates Rubber Company, The. Hysteresis battery charger. 3,919,618, Cl. 320-39.000.

Colgate-Palmolive Company: *See—*
Anstett, Raymond Michael; Buck, Charles Edward; and Sheaffer, Victor Earl, 3,919,101.
Perla, Giulio; and Mannara, Giuseppe, 3,919,409.

Colligan, John J.: *See—*
Moult, Roy H.; and Colligan, John J., 3,919,151.

Collins, Kim D., to Research Corporation. Phosphoglycolohydroxamic acid and derivatives thereof. 3,919,360, Cl. 260-943.000.

Collmer, Alfred: *See—*
Reinbeck, Hans; Stracke, Karl-Hubert; and Collmer, Alfred, 3,919,576.

Colonial Metals, Inc.: *See—*
Davies, Ronald F.; and Benvegno, George J., 3,919,121.

Columbia Machine, Inc.: *See—*
Carlson, Lloyd; and Schmitt, Robert A., 3,918,575.

Combustion-Engineering, Inc.: *See—*
Fallon, George William, III, 3,918,941.
Green, Joseph M., 3,918,889.
Mail, Issac P., 3,919,081.

Comer, William T.; and Roth, Herbert R., to Mead Johnson & Company. Bronchodilator process and composition. 3,919,424, Cl. 424-316.000.

Commerical Solvents Corporation: *See—*
Jurisch, Louis A., 3,919,135.

Commonwealth of Australia, The: *See—*
Rossiter, Michael Weston, 3,918,813.

Commonwealth of Australia care of The Secretary, Department of Supply, The: *See—*
Metcalfe, Kenneth A.; Clements, Alwin S.; and Horrocks, Brian J., 3,918,966.

Comninellis, Christos: *See—*
Plattner, Eric; Comninellis, Christos; and Javet, Philippe, 3,919,057.

Compactor Company, Inc.: *See—*
Hennells, Ransom J.; and Scothorn, Thomas R., 3,918,359.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Villemer, Jean; and Landwerlin, Michel, 3,918,707.

Conn, John L.; and Spector, George. Fuel less water pressure machine. 3,918,827, Cl. 415-5.000.

Conner, Algie J.: *See—*
Stine, Laurence O.; and Conner, Algie J., 3,919,115.

Consolidated Foods Corporation: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Kircher, Robert Edward, 3,918,198.

Construction Forms, Inc.: *See—*
Taylor, Edward A., 3,918,749.

ConTech, Inc.: *See—*
Coyner, Robert N.; and Skujins, Peter, 3,919,173.

Continental Oil Company: *See—*
Stauter, John C., 3,919,080.

Control Data Corporation: *See—*
Hutson, Maurice L.; and Erben, Kurt, 3,919,534.

Cook, John H., to Xerox Corporation. Dashpot for copier optical scanning. 3,918,806, Cl. 355-8.000.

Cooke, Richard C., Jr.: *See—*
Merrill, Duane F.; and Cooke, Richard C., Jr., 3,919,344.

Cooper, Albert S., Jr.: *See—*
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., 3,919,439.

Cooper, Gerald D.: *See—*
Gould, Reed; Wojcik, Charles W.; and Cooper, Gerald D., 3,919,070.

Cooper, Henry E., III; and Gendreau, Edward E., to Terrell Corporation, The. Shoe reinforcing method and material. 3,918,182, Cl. 36-68.000.

Cooper, Irving B.; Gurrieri, Joseph V.; and Lord, Michael J., to Notifier Company. Method and apparatus for operating authorization control systems. 3,919,528, Cl. 235-61.11A.

Cooper, Irving S. Method for electrically stimulating the human brain. 3,918,461, Cl. 128-422.000.

Cooper, Ross E. Collapsible clothes rack. 3,918,591, Cl. 211-178.00R.

Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 3,918,861.

Coplan, Myron J., to Albany International Corporation. Combined surgical suture and needle. 3,918,455, Cl. 128-339.000.

Coraluppi, Enzo; de Saraca, Elio; and Vittore, Lorenzo, to Minnesota Mining and Manufacturing Company. Naphtholic couplers. 3,918,975, Cl. 96-56.100.

Corey, Albert E.; and Donermeyer, Donald D., to Monsanto Company. Acid-modified poly(vinyl acetate) textile sizes. 3,919,449, Cl. 428-245.000.

Cornelison, Floyd S., Jr. Circular kite. 3,918,663, Cl. 244-153.00R.

Cornfeld, Edward, to Cornfeld, Edward. Tampons impregnated with contraceptive compositions. 3,918,452, Cl. 128-270.000.

Corning Glass Works: *See—*
Anderson, Elmer L.; and Hillman, Thomas F., 3,918,871.
Best, Howard S.; Milliman, Bruce A.; and Zak, Edward J., 3,918,216.
Cantaloupe, Francis A.; Frost, Rodney I.; and Holleran, Louis M., 3,919,384.
Cotter, Douglas A., 3,919,473.
Herczog, Andrew, 3,918,147.

Corry, Thomas M., to General Motors Corporation. Apparatus for generating three-phase sinusoidal voltages. 3,919,619, Cl. 321-5.000.

Cosby, Harvey S. Ammonium sulfate and ammonium nitrate admixtures as boll weevil eradicants. 3,919,416, Cl. 424-162.000.

Coscia, Giovanni. Closed mixer for rubber, plastics and the like. 3,918,690, Cl. 259-191.000.

Costa, Ubaldo, to S.E.C.I. Soc. Elettrotecnica Chimica Italiana S.p.A. Electrical resistor with a polycrystalline ceramic cover and a process for its manufacture. 3,919,682, Cl. 338-262.000.

Cotter, Douglas A., to Corning Glass Works. Signal correction system. 3,919,473, Cl. 178-7.200.

Cotterell, Robert Frederick Joseph, to Profile Expanded Plastics Limited. Moulding heat expandable thermoplastic material. 3,919,370, Cl. 264-45.400.

Coupland, John R.: *See—*
Kronies, Reinhard K.; and Coupland, John R., 3,919,692.

Coutellier, Paul Lucien. Flap cover with water distributing device for sanitary apparatuses. 3,918,104, Cl. 4-6.000.
Cowan, Larry Clyde, to Leesona Corporation. Fluid waveform shaping devices. 3,918,677, Cl. 251-61.100.
Cowlishaw, David: *See—*
Doe, Ernest Edward; and Cowlishaw, David, 3,918,481.
Coyner, Robert N.; and Skujins, Peter, to ConTech, Inc. Moisture curable polyurethane systems. 3,919,173, Cl. 260-77.5AT.
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., to International Business Machines Corporation. Memory system. 3,919,700, Cl. 340-173.0MS.
Craft, James Alexander, to International Business Machines Corporation. Pneumatic sheet transport and alignment mechanism. 3,918,706, Cl. 271-250.000.
Craig, Harold M.: *See—*
Yamarik, George J.; and Craig, Harold M., 3,918,835.
Crandall, Richard Eugene, to Electronics Research Group, Inc. High power operational amplifier. 3,919,655, Cl. 330-30.00D.
Crawley, Stanley; and Taylor, Walter, to BOC Limited. Metal removal apparatus. 3,918,209, Cl. 51-5.00D.
Criscimagna, Tony N., to International Business Machines Corporation. Gas panel with improved write-erase and sustain circuits and operations. 3,919,591, Cl. 315-169.0TV.
Crisler, Larry R., to United States of America, Energy Research and Development Administration. Monaqueous actinide hydride dissolution and production of actinide β-diketonates. 3,919,273, Cl. 260-429.100.
Crisler, Larry R., to United States of America, Energy Research and Development Administration. Nonaqueous method for dissolving lanthanide and actinide metals. 3,919,274, Cl. 260-429.100.
Crooke, Robert C.: *See—*
Graham, John R.; and Crooke, Robert C., 3,918,380.
Crosby, Gordon, Jr.: *See—*
Warren, Bert; Crosby, Gordon, Jr.; and Evans, George L., 3,918,905.
Crosley, Thomas W.; and Miller, Howard R., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus on in-circuit testing of a group of sequentially-operated system output bistable devices. 3,919,504, Cl. 179-175.20R.
Cross Company, The: *See—*
Runft, Rudi K., 3,918,348.
Crossley, Jack; and Wilson, David Henry, to Manesty Machines, Ltd. Tabletting machines. 3,918,873, Cl. 425-345.000.
Crounse, Nathan N.; and Ambrosiano, Nicholas A., to Sterling Drug Inc. Polycyclic iminoisoindoline chelates. 3,919,235, Cl. 260-270.0PD.
Crucible Inc.: *See—*
Ratnam, Devineni V., 3,919,001.
Cubberly, Walter E., Jr., to Schlumberger Technology Corporation. Apparatus for protecting downhole instruments from torsional and lateral forces. 3,918,519, Cl. 166-53.000.
Cullen, Donald L.: *See—*
Foster, George B.; and Cullen, Donald L., 3,918,816.
Cullen, Francis M.; Roshon, David D., Jr.; and Snyder, Keith A., to International Business Machines Corporation. Wear-resistant surface for magnetic heads consisting of diamond particles. 3,919,717, Cl. 360-122.000.
Cullen, John S.; and Huber, Paul W., to Multiform Desiccant Products, Inc. Desiccant end cap. 3,918,578, Cl. 206-204.000.
Culpin, Michael Frank: *See—*
Fox, John Cuthbert; Winterbottom, Martin Richard; and Culpin, Michael Frank, 3,918,399.
Cunningham, Hugh: *See—*
Raetzsch, Carl W.; Darlington, William B.; and Cunningham, Hugh, 3,919,059.
Curby, William A., to Lahey Clinic Foundation, Inc. Microparticle analysis. 3,919,050, Cl. 195-103.50R.
Cushman, Donald R.; and Schick, John W., to Mobil Oil Corporation. Wax emulsions. 3,919,149, Cl. 260-28.5AV.
Cutler, Edward T.: *See—*
Cutler, Louis E.; and Cutler, Edward T., 3,919,076.
Cutler-Hammer, Inc.: *See—*
Allison, Arthur F., 3,918,574.
Cutler, Louis E.; and Cutler, Edward T., to Pilot Research & Development Co. Re-refining used automotive lubricating oil. 3,919,076, Cl. 208-180.000.
Cyphelly, Ivan Jaroslav. Device for transmitting a pressure fluid from a stationary source to a rotating shaft. 3,918,486, Cl. 137-580.000.
Czarnojan, Wolfram: *See—*
Horster, Horst; Pusschert, Walter Alfred; Schweppe, Heinz; and Czarnojan, Wolfram, 3,919,570.
Czech, James I.: *See—*
Platt, Clark I.; and Czech, James I., 3,918,644.
Czernik, Daniel E.; and Neff, Clarence H., to Felt Products Mfg. Co. Locator assembly for mounting members for rotary gap bridging and sealing devices. 3,918,165, Cl. 33-174.00G.
D. B. Oswald & Company Limited: *See—*
Oswald, Donald Buchanan; and Douglas, Melvin, 3,918,289.
D. H. Baldwin Company: *See—*
Bunger, David A., 3,918,341.
Uetrecht, Dale M., 3,919,648.
Daeninckx, Jean: *See—*
Zviak, Charles; and Daeninckx, Jean, 3,919,419.
Dahlmans, Johannes J.; and Meijerink, Theo A. J., to Stamicarbon B.V. Insoluble carrier-bound enzymes. 3,919,048, Cl. 195-63.000.
Dai Nippon Printing Company Limited: *See—*
Mizuno, Shogo, 3,918,895.
Daikin Kogyo Kabushiki Kaisha: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,919,361.
Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf; and Knoll, Heinz W., 3,918,545.
Kramer, Willi; and Fietz, Peter, 3,918,547.
Dainippon Ink & Chemicals Inc.: *See—*
Takahashi, Akikazu; Futatsugi, Yuji; Yao, Takamu; and Higashide, Yoichi, 3,919,440.
Daiwa Boseki Kabushiki Kaisha: *See—*
Suzuki, Yoshihisa, 3,918,248.
Dallwigk, Edouard: *See—*
Volker, Theodor; Hering, Klaus; and Dallwigk, Edouard, 3,919,236.
Dally, James W.: *See—*
Verduzco, Miguel A.; and Dally, James W., 3,918,288.
Dalton, Thomas B., to Westran Corporation. Rotary actuated directional control valve. 3,918,494, Cl. 137-625.230.
D'Altrui, Thomas N. Demountable storage racks. 3,918,590, Cl. 211-176.000.
Darlington, William B.: *See—*
Raetzsch, Carl W.; Darlington, William B.; and Cunningham, Hugh, 3,919,059.
Dart Industries Inc.: *See—*
Dieckmann, Dale J., 3,919,168.
Daryanani, Gobind Tahilram, to Bell Telephone Laboratories, Incorporated. Balancing network for voice frequency telephone repeaters. 3,919,502, Cl. 179-170.00D.
Datta, Ranajit K., to General Electric Company. Thoria-yttria emission mixture for discharge lamps. 3,919,581, Cl. 313-345.000.
Davies, Ronald F.; and Benvegno, George J., to Colonial Metals, Inc. Method for precipitating platinum metal on a support. 3,919,121, Cl. 252-466.0PT.
Davis, Charles R. Machine work transfer apparatus. 3,918,280, Cl. 72-22.000.
Davis, Claude A.: *See—*
Stendig, Joseph L.; and Davis, Claude A., 3,919,705.
Davis & Geck Australia Pty. Limited: *See—*
Evers, Roy J.; and Perrett, Darcy Glen, 3,918,124.
Davis, Jack W.: *See—*
Caruolo, Antonio B.; Davis, Jack W.; and Walch, Allen P., 3,919,663.
Davis, Lyman Clifford, to Johns-Manville Corporation. Battery plate retainer mat and method of manufacture. 3,918,994, Cl. 136-145.000.
Davis, Neal R. Bendable plug wire-to-spark plug connector. 3,918,789, Cl. 339-245.000.
Davis, Ralph A., to Dow Chemical Company, The. Recovery of hydrogen bromide from aromatic bromides. 3,919,398, Cl. 423-481.000.
Davis, Robert F. Apparatus for attaching members to articles. 3,919,038, Cl. 156-511.000.
Davis, Robert H.; Oberright, Edward A.; and Schick, John W., to Mobil Oil Corporation. Lubricant compositions containing alkylene oxide polymers and sulfur. 3,919,093, Cl. 252-31.000.
Dawans, Francois; and Durand, Jean-Pierre, to Institut Francais du Petrole. Vulcanizable compositions and the vulcanized compositions obtained therefrom. 3,919,133, Cl. 260-5.000.
Dawson, Walter F., to United States of America, Environmental Protection Agency. Dual temperature controller. 3,918,636, Cl. 236-78.000.
Dayco Corporation: *See—*
Ray, Robert L., 3,919,025.
Dazzi, Joachim, to Ciba-Geigy Corporation. Process for the manufacture of s-triazinyl-monoisocyanates or s-triazinyl-diisocyanates. 3,919,221, Cl. 260-249.500.
De Soto, Inc.: *See—*
Young, Richard A.; and Radak, William J., 3,919,349.
Dean, William Bruce, to Johnson & Johnson. Drapery fabrics and methods of making the same. 3,918,134, Cl. 28-72.0FT.
deBonte, Marinus: *See—*
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,678.
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,942.
Debski, Joseph Z. Specialty knife. 3,918,158, Cl. 30-314.000.
Decca Limited: *See—*
Phillipson, Alan; Spiller, Basil Harry Royston; Newman, Cyril Leslie; and Smith, Robin, 3,918,875.
Decks, Incorporated: *See—*
Carroll, Frank E., 3,918,230.
Deere & Company: *See—*
Whisler, Edwin Lee, 3,918,271.
Deeter, Ronald C.; and Pozniko, John, to Salem Tool Company, The. Auger section handling apparatus. 3,918,536, Cl. 175-85.000.
Degenhart, Thomas Wayne; and De Visser, Christian, to General Electric Company. Interlocking arrangement for a pair of electrical contactors. 3,919,675, Cl. 335-160.000.
Dejardin, Jean V.: *See—*
Lapiere, Charles L.; Dejardin, Jean V.; and Mania, Barbara R., 3,919,248.
De Klerr, Jacobus Johannes Maria Joseph: *See—*
Hasker, Jan; and De Klerr, Jacobus Johannes Maria Joseph, 3,919,583.

De Masi, Loris. Doll simulating natural sucking motion and control device for same. 3,918,199, Cl. 46-247.000.

Dengyosha Machine Works, Ltd.: *See—*
Kida, Kazuo; and Kubota, Naokazu, 3,918,841.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Marubashi, Kiyonobu; Oshima, Hideji; and Sakano, Yasuaki, 3,919,281.

Dennis, Gene Patrick: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Kircher, Robert Edward, 3,918,198.

Denzer, Alan R.; and Powers, Edward F., Jr., to Zamax Manufacturing Co., Inc. Collapsible golf cart. 3,918,735, Cl. 280-36.00C.

de Saraca, Elio: *See—*
Coraluppi, Enzo; de Saraca, Elio; and Vittore, Lorenzo, 3,918,975.

De Smet, Jean Albert, to Extraction de Smet. Method for drying and cooling meal and apparatus for the working thereof. 3,918,169, Cl. 34-15.000.

Despain, James E., to Towmotor Corporation. Vehicle speed indicator system. 3,919,689, Cl. 340-62.000.

Despalmes, Friedrich, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Transporting and lifting vehicle for heavy loads. 3,918,682, Cl. 254-87.000.

Desy, Jacques J., to Rotron, Incorporated. Electrical motor construction. 3,919,572, Cl. 310-45.000.

Detprotector, Inc.: *See—*
Sons, James E., 3,919,600.

Devaney, Robert P.; Fellner, Erwin J.; and Cohen, William A., to Sierra Engineering Co. Threaded earcup suspension system. 3,918,098, Cl. 2-209.000.

De Visser, Christian: *See—*
Degenhart, Thomas Wayne; and De Visser, Christian, 3,919,675.

De Vries, Robert C.; and Fleischer, James F., to General Electric Company. Solution-precipitation process for manufacturing cubic boron nitride abrasive tools. 3,918,931, Cl. 51-309.000.

De Zuba, George P.: *See—*
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,919,161.

Dhake, Bhimashanker G.: *See—*
High, Gerald S.; and Dhake, Bhimashanker G., 3,918,984.

Dial Industries, Inc.: *See—*
Macho, Jan M.; and Oxford, Richard O., 3,918,733.

Diamant, Marcus. Protective wrappers for substantially solid objects. 3,918,579, Cl. 206-306.000.

Diamond Shamrock Corporation: *See—*
Gordon, Scott C.; and Theodore, Ares N., 3,919,337.
Papalos, John G., 3,918,983.

Diana, Guy D., to Sterling Drug Inc. 3-(Substituted amino)-1H-isoindoles. 3,919,202, Cl. 260-240.00F.

Dickson, LeRoy D.: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.

Dieckmann, Dale J., to Dart Industries Inc. Vinyl halide resin stabilizer compositions of organotin or antimony organic sulfur-containing compounds and tri-alkali metal phosphates. 3,919,168, Cl. 260-45.75S.

Diego, Joseph: *See—*
Greenbarg, Nathan M., 3,919,032.

Diery, Helmut: *See—*
Ong, Sienling; Diery, Helmut; and Weyer, Hans-Jurgen, 3,918,900.

Dietze, Wolfgang; and Sandmann, Herbert, to Siemens Aktiengesellschaft. Container for the production of semiconductor bodies. 3,918,396, Cl. 118-49.100.

Disteldorf, Josef: *See—*
Schmitt, Karl; Disteldorf, Josef; and Schmitt, Felix, 3,919,218.

Dixon, Don P.; and Bertva, John T. Automobile air conditioning system. 3,918,270, Cl. 62-239.000.

DMI Inc.: *See—*
Kinzenbaw, Jon E., 3,918,528.

Dochnahl, Hans, to Draftex GmbH. Window guide. 3,918,206, Cl. 49-441.000.

Dr. -Ing. H. c. F. Porsche Aktiengesellschaft: *See—*
Hofmann, Rudolf; and Klemmer, Herbert, 3,918,737.

Dodd, Alan J.: *See—*
Knott, Ken E.; and Dodd, Alan J., 3,918,686.

Doe, Ernest Edward; and Cowlishaw, David, to Bryan Donkin Company Limited, The. Gas supply apparatus. 3,918,481, Cl. 137-504.000.

Doherty, Donald W., to Queen Manufacturing Co., Inc. Hanger assembly. 3,918,670, Cl. 248-214.000.

Dolco Packaging Corporation: *See—*
Reinhart, Fred; and Bolton, Edwin C., 3,919,036.

Dolhyj, Serge R.: *See—*
Milberger, Ernest C.; Dolhyj, Serge R.; and Miko, Steven J., 3,919,257.

Dolney, Theodore J.: *See—*
Lynch, John P.; and Lynch, Delmar J., 3,918,204.

Dolza, John, Sr. Segregated lean-rich fed spark ignition engine. 3,918,419, Cl. 123-75.00B.

Donahue, Stephen F.: *See—*
Glass, Max E.; Donahue, Stephen F.; Urton, John T.; and Carlson, Arthur, Jr., 3,919,411.

Doncer, Alexander J.; and White, Harold R., to Alar Engineering Corporation. Rotary vacuum filter. 3,919,088, Cl. 210-402.000.

Donermeyer, Donald D.: *See—*
Corey, Albert E.; and Donermeyer, Donald D., 3,919,449.

Donnadieu, Henri, to Institut de Recherches de la Siderurgie Francaise. Arrangement for use in the study of the propagation of cracks. 3,918,299, Cl. 73-91.000.

Donnelly Mirrors, Inc.: *See—*
Kurz, Arthur W., Jr.; and Wilson, Harold R., 3,918,799.

Donner, Sigmar, to Kleindienst & Co., Firma. Document deflecting and stacking apparatus for use in document sorting. 3,918,700, Cl. 271-64.000.

Dorsey, Denis Peter; Rodda, William E.; and Filson, Ralph Stuart, to RCA Corporation. Automatic target control system for a television camera tube. 3,919,472, Cl. 178-7.200.

Douglas, Bobby L.; and Williams, Robert C., to Dresser Industries, Inc. Oil well pumpoff control system utilizing integration timer. 3,918,843, Cl. 417-12.000.

Douglas, Melvin: *See—*
Oswald, Donald Buchanan; and Douglas, Melvin, 3,918,289.

Dow Chemical Company, The: *See—*
Beck, Henry Nelson, 3,919,404.
Carini, Piertommaso, 3,919,034.
Davis, Ralph A., 3,919,398.
Dunbar, Joseph E.; and Rogers, Joan H., 3,919,212.
Goralski, Christian T., 3,919,213.
Hall, Richard H.; Haigh, Daniel H.; Archer, Wesley L.; and West, Peter, 3,919,335.
Moore, Eugene R.; Lehrer, Ronald G.; Lyons, Charles E.; and McKeever, Leland Dennis, 3,919,354.
Rakshys, Joseph W., Jr.; and McKinley, Suzanne V., 3,919,126.
Ramsey, David W.; and Jayroe, Charles H., 3,919,169.
Shier, George D., 3,919,259.
Small, Hamish; and Stevens, Timothy S., 3,918,906.
Tigner, Reuben A., 3,919,122.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,215.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,216.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,219.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,220.

Dow Corning Corporation: *See—*
Bennett, Donald R.; and McHard, James A., 3,919,417.
Le Grow, Gary E.; and Speier, John L., 3,919,276.

Dow, James; Lloyd, Ronald; and Patchell, Albert George, to Smith & Nephew Polyfabrik Limited. Production of tapes and fibrous materials. 3,919,377, Cl. 264-147.000.

Dowty Rotol Limited: *See—*
Poucher, Michael; and Brooking, Ivor Harold, 3,918,837.

Drabek, Jozef, to Ciba-Geigy AG. O-ethyl-S-n-propyl-O-3,4,5-trihalophenyl phosphates. 3,919,362, Cl. 260-964.000.

Draftex GmbH: *See—*
Dochnahl, Hans, 3,918,206.

Dragerwerk AG: *See—*
Franz, Wolfgang; and Stallbaum, Jens, 3,918,432.
Zimmer, Hildebrand, 3,918,439.

Dravo Corporation: *See—*
Selmeczi, Joseph G., 3,919,393.
Selmeczi, Joseph G., 3,919,394.

Dresser Industries, Inc.: *See—*
Douglas, Bobby L.; and Williams, Robert C., 3,918,843.

Drew, Bernard, Jr., to Gainesville Machine Company, Inc. Apparatus for detecting and dispensing articles of preselected weights suspended from shackles. 3,918,587, Cl. 209-121.000.

Drexelbrook Controls, Inc.: *See—*
Maltby, Frederick L., 3,918,306.

Dreyer, Frederic C.: *See—*
Korodi, Miklos B.; and Dreyer, Frederic C., 3,918,454.

Drori, Moshe. Liquid fuel pumping apparatus. 3,918,853, Cl. 417-462.000.

Drower, Herbert M.; and Korinek, Robin, to Transilwrap Company, Inc. Laminating pouch and integrated carrier. 3,918,188, Cl. 40-158.00R.

Drummond, Warren W., to PPG Industries, Inc. Method and apparatus for making a bulky yarn. 3,918,244, Cl. 57-6.000.

Dryer, Eldon O., to W.S. Shamban & Co. Captive plastic seal. 3,918,725, Cl. 277-167.500.

Du Pont of Canada Ltd.: *See—*
Wolstencroft, Michael John, 3,918,501.

Dubeck, Michael; and Im, Suk Joong, to Ethyl Corporation. Process for winning copper using carbon monoxide. 3,918,962, Cl. 75-117.000.

Dubin, Robert R.: *See—*
Will, Fritz G.; and Dubin, Robert R., 3,918,992.

Dubrow, Paul L., to Nalco Chemical Company. Thickening of solvent explosives systems. 3,919,016, Cl. 149-60.000.

Duennenberger, Max: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 3,919,331.

Duer, Morris J. Bullet. 3,918,364, Cl. 102-92.100.

Dufresne, Eugene R., to Chicago Rawhide Manufacturing Company. Modified elastomeric compositions, method and oil seals made therefrom. 3,919,448, Cl. 428-157.000.

Dugan, Martin F.; and Bowlus, Daniel A., to United States of America, Navy. Valveless rotary piston expansion engine. 3,918,859, Cl. 418-187.000.

Dukich, Peter P.; Lechevalier, Robert L.; and Volk, John A., to Honeywell Inc. Head attached television. 3,919,475, Cl. 178-7.910.

Dultsev, Vadim Alexandrovich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; An-

drushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Dunbar, Joseph E.; and Rogers, Joan H., to Dow Chemical Company, The. Preparation of aminecarbotrithioates. 3,919,212, Cl. 260-246.00B.

Dunham-Bush, Inc.: *See—*
Moody, Harold W., Jr.; and Bulkley, Clifford T., 3,918,838.
Runninger, Frederick L., 3,918,886.

Dunham, James A.; Federle, August J.; and Sorbie, Thomas B., to Owens-Illinois, Inc. Container stabilizing apparatus. 3,918,570, Cl. 198-19.000.

Dunlop Limited: *See—*
Mitchell, William E., 3,918,507.
Mitchell, William Eric, 3,918,508.

Dunn, Harold H. Yarn heat treating process. 3,918,111, Cl. 8-149.100.

Dunn, Robert E.: *See—*
Bourgraf, Elroy E.; Dunn, Robert E.; and Self, Kenneth R., 3,918,554.

Du Pont de Nemours, E. I., and Company: *See—*
Andreades, Sam; and Baird, Richard L., 3,919,227.
Boswell, George A., Jr.; and Brittelli, David R., 3,919,204.
Brown, Theodore E., Jr.; and Willis, Frank M., 3,918,235.
Chay, Dong Myung, 3,919,401.
Lin, Kang, 3,919,284.
Parshall, George W., 3,919,271.
Sam, Donnie Joe; and Wuonola, Mark A., 3,919,423.
Squire, Edward Noonan, 3,919,155.

Durand, Jean-Pierre: *See—*
Dawans, Francois; and Durand, Jean-Pierre, 3,919,133.

Durand Machine Company Limited: *See—*
Tyler, Reginald E. W.; and Carter, Paul M., 3,918,586.

DuRocher, Daniel J.: *See—*
DuRocher, Gideon A.; and DuRocher, Daniel J., 3,918,783.

DuRocher, Gideon A.; and DuRocher, Daniel J., to Essex International, Inc. Apparatus for electrically connecting conductors on glass substrates. 3,918,783, Cl. 339-17.0LC.

Durst, Roland; and Schweizer, Kurt, to Traub, Hermann. Apparatus for feeding elongated material to a machining tool. 3,918,594, Cl. 214-1.500.

Dybala, Ambrose B.; Jesiolowski, David; Nowicki, Casimir W.; and Shapler, Thomas A., to Owens-Illinois, Inc. Apparatus for multi-orifice extrusion. 3,918,874, Cl. 425-381.000.

Dyer, James N.; and Yu, Arthur J., to Stauffer Chemical Company. Process for making polyvinyl chloride processing aid involving cooling step in acrylate graft polymerization of polyvinyl chloride. 3,919,137, Cl. 260-17.00A.

Dyke, Raymond William, to Vosper Thornycroft Limited. Gas cushion vehicles. 3,918,548, Cl. 180-117.000.

Dymoke-Bradshaw, Leslie E. B., to International Standard Electric Corporation. Electro-acoustic transducers. 3,919,500, Cl. 179-115.00A.

Dynamit Nobel Aktiengesellschaft: *See—*
Lenz, Arnold; and Rogler, Walter, 3,919,405.

E-Med Corporation: *See—*
Buttaravoli, Philip M., 3,918,446.

E. R. Squibb & Sons, Inc.: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 3,919,205.

Earp, Ronald Lee, to Bell Telephone Laboratories, Incorporated. Logic circuit fault detector. 3,919,637, Cl. 324-73.00R.

Eastman Kodak Company: *See—*
Allen, Robert P.; and Holmes, Jerry D., 3,919,255.
Barlow, Fred D., Jr.; and Moriarty, Joseph A., 3,919,307.
Fearnside, William T., 3,918,395.
Khanna, Ravi; and Jacoby, Frederick J., 3,919,156.
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 3,919,176.
Owen, John R., 3,918,978.

Eaton Yale Ltd.: *See—*
Jasinski, Stanley C., 3,918,476.

Ebara Manufacturing Co., Ltd.: *See—*
Ishiguro, Juichi; Miyasaka, Matsuho; and Kitajima, Nobumitsu, 3,918,623.

Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, to BASF Aktiengesellschaft. Transparent yellow iron oxide pigment. 3,918,985, Cl. 106-304.000.

Eberhardt, H. Alfred, to Hale Fire Pump Company. Valve seat insert. 3,918,681, Cl. 251-317.000.

Eberle, Marcel K.; and Manning, Robert E., to Sandoz Inc. 2-Amino-5-(substituted or unsubstituted phenylalkyl)1,3,4-thiadiazoles for treating anxiety. 3,919,428, Cl. 424-270.000.

Eberspacher, J.: *See—*
Kofink, Siegfried, 3,918,637.

Ebert, Gary R.; and Flones, Roy H., to Ex-Cell-O Corporation. Adjustable tool holder. 3,918,333, Cl. 82-36.00R.

ECC Corporation: *See—*
Tippett, Daniel R.; and Fricker, David C., 3,919,617.

Eckelt, Michael: *See—*
Heyden, Rudi; and Eckelt, Michael, 3,919,111.

Ecker, Franklin A.: *See—*
Haffner, Donald G.; Meyer, Dean A.; Ecker, Franklin A.; and Akgulian, Sahag C., 3,918,240.

Eckert, Hans-Werner; Nikolaus, Peter; and Schwarzer, Johann, to Henkel & Cie G.m.b.H. Fabric softening compositions containing quaternary allophanoylmethylammonium compounds. 3,919,091, Cl. 252-8.800.

Eckhoff, Paul S. Chemistry and process for a stain resistant aqueous house paint free of heavy metals. 3,919,145, Cl. 260-22.0TN.

Ecodyne Corporation: *See—*
Shaffer, Robert L., 3,919,090.

Edenhofer, Albrecht; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. 3a,12b-Dihydro-8H-dibenzo[3,4,6,7]cyclohept[1,2-d]oxazol-8-ones and process for their preparation. 3,919,311, Cl. 260-552.00R.

Edmisson, Jerry L.: *See—*
Walser, Ronald D.; and Edmisson, Jerry L., 3,918,588.

Edwards, Lindell N., to Universal Modular Structures, Inc. L-connector for grooved structural elements. 3,918,232, Cl. 52-738.000.

Egger, Helmut; and Reinshagen, Hellmuth, to Sandoz Ltd. Substituted 14-desoxy-mutilins. 3,919,290, Cl. 260-481.00R.

Egorova, Ekaterina Ivanovna: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Combination pickling-rolling mill. 3,918,282, Cl. 72-39.000.

Eichenberger, Jurg; Perlhefter, Norbert; and Bole, Pierre-Andre, to Ciba-Geigy Corporation. Process for preparing an intermolecular compound of 2-methylthio-4-ethylamino-6-tert.butyl-amino-s-triazine and an asymmetrically substituted chlorotriazine. 3,919,222, Cl. 260-249.800.

Eichenberger, Walter; Mulraney, David; and Reese, Melton E., to Rainville Company, Inc. Apparatus for detecting deposits on core rods. 3,918,866, Cl. 425-136.000.

Eichler, Joachim, to Sulzer Brothers Limited. Artificial hip joint. 3,918,102, Cl. 3-1.912.

Eiermann, Dankwart; and Wankel, Felix, to Wankel GmbH. Compound rotary piston engine. 3,918,413, Cl. 123-8.070.

Eilertson, Warren H. Circulation control rotor hub using teacup cam and pushrod valves. 3,918,833, Cl. 416-20.000.

Einolf, Charles W., Jr.; and Neuner, James A., to Westinghouse Electric Corporation. Electrical fault indicator. 3,919,533, Cl. 235-153.0AC.

Eisai Co., Ltd.: *See—*
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, 3,919,436.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton, 3,918,505.

Eklof, Ake Torsten; and Romell, Gunnar Vigg Riss, to Atlas Copco Aktiebolag. Device for damping the recoil of a tool connected to a hammer machine. 3,918,535, Cl. 173-162.000.

ELBATAINER Kunststoff- und Verpackungs-Gesellschaft mbH & Co.: *See—*
Kormendi, Kalman, 3,919,373.

Electric Power Storage Limited: *See—*
Adderley, Edward; and Schwendener, Derek Kurt, 3,918,993.

Electro Oxide Corporation: *See—*
Smith, Baynard R.; and Treptow, Arnold W., 3,918,980.

Electronics Research Group, Inc.: *See—*
Crandall, Richard Eugene, 3,919,655.

Electronics Stamping Corporation: *See—*
Walter, Leo; and Greul, Helmut W., 3,918,788.

Eli Lilly and Company: *See—*
Lammert, Steven R.; and Kukolja, Stjepan, 3,919,209.
Molloy, Bryan B., 3,919,316.
Stevenson, Charles E.; and Coffey, Henry F., 3,918,913.

Elliger, Carl A.; Waiss, Anthony C., Jr.; and Booth, Albert N., to United States of America, Agriculture. Detoxification of jojoba meal. 3,919,432, Cl. 426-319.000.

Ellingson Timber Company: *See—*
Shoemaker, Philip D.; and McQueary, Hobert O., 3,919,017.

Ellington, Gordon H.: *See—*
Warnock, Emmit F.; Williamson, Bobby Wayne; Ellington, Gordon H.; and Mitchell, William O., 3,918,335.

Elliott Brothers (London) Limited: *See—*
Pudsey, David Graham, 3,919,708.

Ellis, Belvin B.: *See—*
Burkhardt, Charles E.; and Ellis, Belvin B., 3,918,153.

Ellison, Clinton E., Jr. Pet access panel. 3,918,203, Cl. 49-168.000.

Elser, Dieter: *See—*
Jablonsky, Erich; Pfundstein, Wolfgang; and Elser, Dieter, 3,918,544.

Elton Industries, Inc.: *See—*
Nolte, Albert C., Jr., 3,919,718.

Emhart (U.K.) Limited: *See—*
Foster, Thomas Vincent; and Fenton, Frank Alan, 3,918,489.

EMI Limited: *See—*
Hounsfield, Godfrey Newbold, 3,919,552.

Emmons, William D., to Rohm & Haas Company. Caulking composition comprising polymer having addition polymerized backbone having carboxyl groups esterified with drying oil fatty acid glycidyl ester. 3,919,146, Cl. 260-23.0EP.

Empey, Richard A.; and Pettitt, David J., to Kelco Company. Decreasing bacterial contamination of xanthan gum with propylene oxide. 3,919,189, Cl. 260-209.00R.

Endo, Norio: *See*—
Ida, Syunya; and Endo, Norio, 3,918,901.
Engele, Horst: *See*—
Huwyler, Franco; and Engele, Horst, 3,919,466.
Engelhard Minerals & Chemicals Corporation: *See*—
Burns, Robert A., 3,919,159.
Engelstatter, Heinz: *See*—
Mahlich, Gotthard; and Engelstatter, Heinz, 3,919,594.
Engineered Systems, Inc.: *See*—
Hunting, Robert A.; and Van Ness, Bradford O., 3,919,461.
Englund, James A.; and Buck, Basil H., to Alcan Aluminum Corporation. Venetian blind with worm gear tilting assembly. 3,918,513, Cl. 160-176.000.
Enters, Robert F., to McGraw-Edison Company. Alkaline storage battery and zinc negative electrode therefor. 3,918,990, Cl. 136-28.000.
Enthone, Incorporated: *See*—
Brindisi, Frank A., Jr.; Wynschenk, Jo; and Wieczorek, Theophil J., 3,919,100.
Environics, Inc.: *See*—
Lee, Yuan C.; Kline, Jules M.; and Stary, Marvin L., 3,918,932.
Environmental Development Corporation: *See*—
Swingle, Benny F., 3,918,263.
Environmental Graphic Systems, Inc.: *See*—
Vogele, Robert E., 3,918,187.
Epstein, Michael: *See*—
O'Connor, Bernard J.; Shaw, Richard, Jr.; and Epstein, Michael, 3,918,309.
Erben, Kurt: *See*—
Hutson, Maurice L.; and Erben, Kurt, 3,919,534.
Eremenko, Nickolai Yakovlevich: *See*—
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.
Erikson, J. Alden: *See*—
Chang, Wen-Hsuan; Erikson, J. Alden; and Porter, Samuel, Jr., 3,919,351.
Ernest, Robert P., to Ford Motor Company. Rotary engine with side mounted spark plugs. 3,918,416, Cl. 123-8.450.
Ernst Leitz G.m.b.H.: *See*—
Kraft, Winfried, 3,918,793.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Method of making gaseous discharge device having lower operating voltages of increased uniformity. 3,918,136, Cl. 29-25.110.
Ernsthausen, Roger E.: *See*—
Hoehn, Harold J.; and Ernsthausen, Roger E., 3,919,577.
Erway, Duane D.: *See*—
Rowlette, John J., 3,918,607.
Escher Wyss Limited: *See*—
Lehmann, Rolf, 3,918,775.
Eschweiler & Co.: *See*—
Lubbers, Dietrich W.; and Huch, Albert, 3,918,434.
Esco Manufacturing Company: *See*—
Chaney, Don P.; and McClain, James E., 3,918,786.
Escobar, Miguel: *See*—
Manero, Carlos; Escobar, Miguel; Hershberg, Emanuel B.; and Herzog, Hershel L., 3,918,200.
Esemplare, Pascal E.; and Beeferman, Dennis, to Sutures, Inc. Rubber articles having improved slip coating. 3,919,442, Cl. 428-494.000.
Espenschied, Helmut; Rothfuss, Georg; and Smentek, Hans-Dietrich, to Robert Bosch G.m.b.H. Hydraulically operated transmission system for automotive vehicles. 3,918,312, Cl. 74-230.17F.
Essex International, Inc.: *See*—
DuRocher, Gideon A.; and DuRocher, Daniel J., 3,918,783.
Etablissements A. Guerin: *See*—
Pistor, Michel Louis Paul, 3,918,449.
Etat Francais: *See*—
Pierre, Bernard; Volle, Rene; and Simon, Georges, 3,918,347.
Ethyl Corporation: *See*—
Dubeck, Michael; and Im, Suk Joong, 3,918,962.
LaBorde, Joseph N., 3,918,228.
Vennard, William O.; and Wright, Jack C., 3,918,443.
Wilder, Harry D., 3,919,041.
Wollensak, John C., 3,919,332.
Wollensak, John C., 3,919,333.
Eto, Yoshiyuki: *See*—
Kato, Masayoshi; Eto, Yoshiyuki; Ikemi, Tadashi; and Matsumoto, Chinami, 3,919,120.
Ettre, Kitty S.; Castles, George Richard; and Petrikas, Aloyzas, to Vitta Corporation. Precision bonding system. 3,919,452, Cl. 428-325.000.
Etzbach, Volker; and Muller, Karlheinz, to Linde Aktiengesellschaft. Compensation of refrigeration losses during the storage of liquefied, low-boiling gaseous mixtures. 3,918,265, Cl. 62-54.000.
Evans, Delme, to Lilly Industries, Ltd. 2-(β-Aminoacryloyl)iminobenzothiazolines. 3,919,201, Cl. 260-240.00J.
Evans, George L.: *See*—
Warren, Bert; Crosby, Gordon, Jr.; and Evans, George L., 3,918,905.
Evans, John L.; Ferriss, Lincoln S.; and Hoffmann, Jay, to Singer Company, The. Capacitive sensing system. 3,918,310, Cl. 74-5.60D.
Evans, Norol T., to Hughes Aircraft Company. Radar video processing system. 3,919,707, Cl. 343-5.0DP.
Evens, Georges Gerard; and Smets, Georges Joseph, to Agfa-Gevaert N.V. Imaging process utilizing a polyester polycondensate containing spiropyran photochromic groups. 3,918,972, Cl. 96-48.00R.
Evers, Roy J.; and Perrett, Darcy Glen, to Davis & Geck Australia Pty. Limited. Separation and isolation of a portion of animal intestine. 3,918,124, Cl. 17-43.000.
Ewald, Ronald F., to Seaquist Valve Company, Div. of Pittway Corporation. Pressure relief system for an aerosol dispenser. 3,918,611, Cl. 222-396.000.
Ex-Cell-O Corporation: *See*—
Allen, Robert J., 3,918,236.
Ebert, Gary R.; and Flones, Roy H., 3,918,333.
Extraction de Smet: *See*—
De Smet, Jean Albert, 3,918,169.
Exxon Production Research Company: *See*—
Heilhecker, Joe K., 3,918,537.
Weber, Ronald A.; Griffin, Zane L.; and Childers, Thomas W., 3,918,485.
Exxon Research and Engineering Company: *See*—
Bagnoli, Donald L.; and Ciuffreda, Anthony R., 3,919,073.
Cohen, Harvey L., 3,919,130.
Malatesta, Alberto; and Baldwin, Francis P., 3,919,131.
Szabo, Karoly, 3,919,359.
Eymard, Pierre Luc: *See*—
Carraz, Gilbert; Pigerol, Charles; Jean-Grandremy, Alain; and Eymard, Pierre Luc, 3,919,229.
F. L. Smidth & Co.: *See*—
Theil, Sven Erich, 3,918,891.
Fabbrica Italiana Magneti Marelli, S.p.A.: *See*—
Huwyler, Franco; and Engele, Horst, 3,919,466.
Faber, Ruth: *See*—
Grossmann, Max; Faber, Ruth; and Uhrig, Heinz, 3,919,429.
Factory Mutual Research Corporation: *See*—
Livingston, William L., 3,918,935.
Fairchild Camera and Instrument Corporation: *See*—
Schinella, Richard D.; and Anthony, Michael P., 3,919,005.
Fairchild, Willis A. Coupling device. 3,918,208, Cl. 151-5.000.
Faiveley S.A.: *See*—
Graziano, Charles, 3,918,201.
Falk, David D.: *See*—
Norton, Charles J.; and Falk, David D., 3,919,092.
Falk, Heinz, to Sandoz Ltd. Elution apparatus and method. 3,919,082, Cl. 210-31.00C.
Faller, Rudolph A., to Hoerner Waldorf Corporation. Dispensing carton. 3,918,608, Cl. 221-63.000.
Fallon, George William, III, to Combustion Engineering, Inc. Mist eliminator gas flow deflector. 3,918,941, Cl. 55-230.000.
Farney, Wesley P. Automatic pleating device. 3,918,573, Cl. 198-165.000.
Farr, Glyn Phillip Reginald, to Girling Limited. Hydraulic braking systems. 3,918,768, Cl. 303-21.00F.
Fawn Hollow Corporation: *See*—
Hayward, Walter W., 3,918,510.
Fearnside, William T., to Eastman Kodak Company. Continuous bias control for electrographic development apparatus. 3,918,395, Cl. 118-8.000.
Federle, August J.: *See*—
Dunham, James A.; Federle, August J.; and Sorbie, Thomas B., 3,918,570.
Feed Recycling Co.: *See*—
Senior, Franklin C., 3,919,433.
Feigel, Harold J., to Neo-Dyne Industries, Inc. Apparatus for testing and emplacing flexible sealed packages. 3,918,293, Cl. 73-49.300.
Feldbrugge, Alonzo H. R.; Rankowitz, Marshall M.; and Huste, Arno, to General Foods Corporation. Meat analog system. 3,919,435, Cl. 426-574.000.
Fellner, Erwin J.: *See*—
Devaney, Robert P.; Fellner, Erwin J.; and Cohen, William A., 3,918,098.
Felten & Guilleaume Kabelwerke Aktiengesellschaft: *See*—
Braun, Dieter, 3,918,864.
Felt Products Mfg. Co.: *See*—
Czernik, Daniel E.; and Neff, Clarence H., 3,918,165.
Felten, Edward J., to United Technologies Corporation. MCrAlY type coating alloy. 3,918,139, Cl. 29-194.000.
Feltz, Louis V.: *See*—
Blackwell, Bennie F.; Feltz, Louis V.; and Maydew, Randall C., 3,918,839.
Feltzin, Joseph: *See*—
Baldino, James P.; and Feltzin, Joseph, 3,919,128.
Fenichel, Richard L.: *See*—
Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., 3,919,302.
Fenner, Erich; and Kuschke, Renate, to Siemens Aktiengesellschaft. Barium titanate ceramic dielectric element. 3,919,099, Cl. 252-63.200.
Fenton, Frank Alan: *See*—
Foster, Thomas Vincent; and Fenton, Frank Alan, 3,918,489.
Fergason, James L., to Hoffmann-La Roche Inc. Liquid-crystal nonlinear light modulators using electric and magnetic fields. 3,918,796, Cl. 350-160.0LC.
Fernandez de Castro, Aurora L. Method for quantitative determination of renin activity in blood. 3,919,407, Cl. 424-12.000.

Ferno-Washington, Inc.: *See—*
Bourgraf, Elroy E.; Dunn, Robert E.; and Self, Kenneth R., 3,918,554.
Ferrero, John: *See—*
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerard, 3,918,307.
Ferres, Harry; and Clayton, John Peter, to Beecham Group Limited. Penicillin esters. 3,919,196, Cl. 260-239.100.
Ferriss, Lincoln S.: *See—*
Evans, John L.; Ferriss, Lincoln S.; and Hoffmann, Jay, 3,918,310.
Fettback, Helmut: *See—*
Fuhr, Jurgen; and Fettback, Helmut, 3,918,099.
Fettweis, Alfred; and Sedlmeyer, Axel, to Siemens Aktiengesellschaft. Digital filter. 3,919,671, Cl. 333-70.00R.
Few, Arthur A., to United States of America, Navy. Electrical field change meter. 3,919,636, Cl. 324-72.000.
Fey, Robert J.: *See—*
Fey, William S.; and Fey, Robert J., 3,918,712.
Fey, William S.; and Fey, Robert J., to Lawrence Peska Associates, Inc., a part interest. Tethered ball. 3,918,712, Cl. 273-58.00C.
Feyerherm, Raymond M. Portable bath lift. 3,918,108, Cl. 4-185.00L.
Fiber Controls Corporation: *See—*
Wise, Cecil S., 3,918,539.
Fiber Industries, Inc.: *See—*
Yankowsky, Anthony Walter, 3,919,383.
Fiber Materials, Inc.: *See—*
Pepper, Roger Thomas; and Bucherati, Frank, 3,918,141.
Field, Robert G.; and Wahl, Donn A., to GTE Sylvania Incorporated. Digital receiving apparatus. 3,919,690, Cl. 340-146.1BA.
Fields, Ellis K.: *See—*
Cerefice, Steven A.; and Fields, Ellis K., 3,919,262.
Fietz, Peter: *See—*
Kramer, Willi; and Fietz, Peter, 3,918,547.
Filson, John Richard, to Minnesota Mining and Manufacturing Company. Snap spade electrical connector. 3,918,790, Cl. 339-257.000.
Filson, Ralph Stuart: *See—*
Dorsey, Denis Peter; Rodda, William E.; and Filson, Ralph Stuart, 3,919,472.
Findeisen, Kurt: *See—*
von Gizycki, Ulrich; Oertel, Gunter; Beck, Guenther; and Findeisen, Kurt, 3,919,228.
Finke, Eugene W., to Monarch Marking Systems, Inc. Integrated piston-cylinder and control valve assembly. 3,918,351, Cl. 91-418.000.
Finnegan, William G.: *See—*
McBride, William R.; Finnegan, William G.; and Adicoff, Arnold, 3,919,012.
First National Bank of Boston, The: *See—*
Moon, Warren D.; Weiner, Richard J.; Hansen, Robert A.; and Linde, Robert N., 3,919,479.
Firth, Angus Christopher; and Sheldon, Frederick John, to Lawrence Wilson & Son Limited. Collapsible structure. 3,918,734, Cl. 280-36.00B.
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted O-(aminosulfonyl)-glycolic anilides. 3,919,282, Cl. 260-456.00A.
Fischer, Adolf A., to United Merchants and Manufacturers, Inc. Adhesive compositions. 3,919,153, Cl. 260-29.4UA.
Fischer, Wilhelm; Kraush, Friedrich; Riesner, Walter; and Sonnenmoser, Hubert, to Lever Brothers Company. Apparatus for the production of cheese. 3,918,356, Cl. 99-452.000.
Fisher, Jules; and Soot, Olaf. Modular floor system. 3,918,225, Cl. 52-126.000.
Fitzgerald, William Maurice Bard. High velocity shaft seal. 3,918,851, Cl. 417-364.000.
Fitzgerald, William Maurice Bard. Hydraulic motors with intermeshing sun and planet gears. 3,918,857, Cl. 418-73.000.
Fives-Cail Babcock: *See—*
Mercier, Andre, 3,918,170.
Fleischer, James F.: *See—*
De Vries, Robert C.; and Fleischer, James F., 3,918,931.
Floessel, Carl Dieter, to BBC Brown Boveri & Company Limited. Tube enclosed pressure gas insulated electrical cable. 3,919,456, Cl. 174-27.000.
Flones, Roy H.: *See—*
Ebert, Gary R.; and Flones, Roy H., 3,918,333.
Florian, Nathaniel, to American Standard Company. Canoe bracket. 3,918,666, Cl. 248-4.000.
Floto, James E., to Goodyear Tire & Rubber Company, The. Method of retreading a tire. 3,919,020, Cl. 156-95.000.
Flowers, Edward: *See—*
Bowen, James Harold; and Flowers, Edward, 3,919,635.
Flucke, Winfried: *See—*
Wollweber, Hartmund; and Flucke, Winfried, 3,919,315.
Fluoroware, Inc.: *See—*
Saville, Russell H.; and Johnson, Douglas M., 3,918,756.
FMC Corporation: *See—*
Berkowitz, Sidney, 3,919,103.
Smith, Frederick R., 3,919,385.
Focella, Antonino: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,919,322.
Foertsch, William H.: *See—*
Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., 3,918,304.
Fogelholm, Carl-Magnus. Special clutch for vibration isolated chain saws. 3,918,534, Cl. 173-162.000.
Fontaine, Jacques P., to Societe Anonyme: Poclain. Pressurized fluid controlled vibrators. 3,918,350, Cl. 91-48.000.
Foote, Robert S. Methods for locating subteranean petroleum-bearing deposits. 3,919,547, Cl. 250-253.000.
Forberg, Hans-Jurgen, to Transcodan. Flow regulating device particularly for infusion and transfusion tubes. 3,918,675, Cl. 251-6.000.
Forbes, Hampton E., Jr.; and LaFreniere, Lawrence J., to Westvaco Corporation. Tubular carton. 3,918,629, Cl. 229-21.000.
Forbes, James T.; and Gantt, James E., to Universal Oil Products Company. Countercurrent catalytic contact of a reactant stream in a multiple-stage process and the apparatus therefor. 3,918,930, Cl. 48-214.000.
Ford Motor Company: *See—*
Anderson, John T.; and Aula, Howard A., 3,918,424.
Berry, Thomas G.; and Fyie, Vincent L., 3,918,421.
Chang, Yun-Feng; Cheung, Mo-Fung; and Labana, Santokh S., 3,919,154.
Ernest, Robert P., 3,918,416.
Labana, Santokh S.; and Theodore, Ares N., 3,919,345.
Postma, Norman D., 3,918,262.
Telang, Yeshwant P.; and Uy, James C., 3,918,137.
Formaini, Robert L.; and Little, Edwin D., to Allied Chemical Corporation. production of polyesters from tris(δ-hydroxyalkyl)isocyanurate alkylene oxide adducts. 3,919,144, Cl. 260-20.000.
Formulabs Industrial Inks, Incorporated: *See—*
Palcic, Kenneth D., 3,918,398.
Forsythe, Alan K., to Hazleton Laboratories, Inc. Orthopedic pin holder. 3,918,727, Cl. 279-50.000.
Fortune, William S. Soldering tip and locking apparatus combination. 3,919,524, Cl. 219-238.000.
Foster, George B.; and Cullen, Donald L., to Autech Corporation. Tire inspection apparatus. 3,918,816, Cl. 356-167.000.
Foster, L. Dale: *See—*
Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, 3,919,540.
Foster, Newton C.; and Smith, James D. B., to Westinghouse Electric Corporation. Epoxy-styrene resin system having improved shelf life. 3,919,348, Cl. 260-837.00R.
Foster, Richard Armstrong: *See—*
Haworth, Lional; Foweraker, David Bruce; and Foster, Richard Armstrong, 3,918,840.
Foster, Thomas Vincent; and Fenton, Frank Alan, to Emhart (U.K.) Limited. Valve block. 3,918,489, Cl. 137-596.160.
Foster Wheeler Energy Corporation: *See—*
Wolowodiuk, Walter, 3,918,411.
Fougere, Guy Lloyd; Greene, Walter John; and Jeffreys, Dennis Clifford, to Mars, Inc. Method and apparatus for coin selection utilizing a programmable memory. 3,918,565, Cl. 194-100.00A.
Fournier, Paul J. E., to Aeroquip Corporation. Remotely releasable self-latching snap hook. 3,918,758, Cl. 294-83.00R.
Foweraker, David Bruce: *See—*
Haworth, Lional; Foweraker, David Bruce; and Foster, Richard Armstrong, 3,918,840.
Fox, John Cuthbert; Winterbottom, Martin Richard; and Culpin, Michael Frank, to Imperial Chemical Industries Limited. Spreading of particulate matter. 3,918,399, Cl. 118-308.000.
Fox, Richard; and Hay, David Gilbert, to ICI Australia Limited. Slurry explosive composition. 3,919,013, Cl. 149-6.
Foxboro Company, The: *See—*
Van Damme, Joseph, 3,918,772.
Frager, Glenn E.; and Penninger, Bill J., to Krause Plow Corporation, Inc. Sectional implement having sequential lifting and lowering. 3,918,529, Cl. 172-294.000.
Frank, Edmund, to Packard Instrument Company, Inc. Elevator mechanism and method for scintillation detectors. 3,919,554, Cl. 250-328.000.
Franz, Wolfgang; and Stallbaum, Jens, to Dragerwerk AG. Method of transporting babies in a heated incubator. 3,918,432, Cl. 128-1.00B.
Fredrickson, Sherman E.: *See—*
Broaddus, Gene C.; and Fredrickson, Sherman E., 3,918,524.
Fresnel, Jean Marie; and Trosset, Daniele, to Battelle Memorial Institute. Method and apparatus for continuously controlling an enzymatic reaction. 3,919,052, Cl. 195-115.000.
Freter, John M.: *See—*
Breakey, James W.; Freter, John M.; and Wren, Jack, 3,918,103.
Fretwell, Richard D., to MI². Mark frequency detector circuit. 3,919,650, Cl. 329-102.000.
Fricker, David C.: *See—*
Tippett, Daniel R.; and Fricker, David C., 3,919,617.
Friebe, Walter-Gunar: *See—*
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,919,226.
Friedel, Rudolf; and Lauterbach, Richard, to Siemens Aktiengesellschaft. X-ray tube anode. 3,919,124, Cl. 252-520.000.
Friedline, Ernest J., to Kennametal Inc. Boring tool having retractable cartridge. 3,918,826, Cl. 408-154.000.
Friedman, Abraham. Coating and method for marking teeth. 3,918,160, Cl. 32-19.000.
Friedman, George: *See—*
Kohn, Harold B.; and Friedman, George, 3,918,918.
Friedrich Uhde, GmbH: *See—*
Mose, Luciano, 3,919,071.
Friedrichsen, Hans Jack; Mahr, Peter Frank; and Schwarz, Alfred Otto, to Bell Telephone Laboratories, Incorporated. Apparatus for establishing cross connections in an automated main distributing frame. 3,919,503, Cl. 179-175.20R.

Friend, Joseph John, to Bell Telephone Laboratories, Incorporated. Active RC filter circuit. 3,919,658, Cl. 330-69.000.

Frier, Frank; Graddy, Willard E.; and Hyden, Daniel W., to General Motors Corporation. Snap-in lever assembly. 3,918,322, Cl. 74-519.000.

Friesem, Albert A., to Harris-Intertype Corporation. Display of multicolor images using a screen with red, blue and green photoluminescent segments. 3,918,803, Cl. 353-121.000.

Fritsch, Werner: *See—*
Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, 3,919,191.

Fritts, Russell A., to Singer Company, The. Sewing machine cabinet. 3,918,780, Cl. 312-30.000.

Fritz, Jack J.; and Lucas, Theodore W., Jr., to Andco Incorporated. Solid waste disposal system. 3,918,373, Cl. 110-8.00R.

Frost, Barry L., to Clark Equipment Company. Extended range dual-path transmission. 3,918,325, Cl. 74-687.000.

Frost, Rodney I.: *See—*
Cantaloupe, Francis A.; Frost, Rodney I.; and Holleran, Louis M., 3,919,384.

Fuhr, Jurgen; and Fettback, Helmut. Artificial organ or part or section thereof for implanation into the human body and method of producing the same. 3,918,099, Cl. 3-1.000.

Fuisz, Richard C. Fluid sampling device. 3,918,433, Cl. 128-2.00F.

Fuji Latex Co., Ltd.: *See—*
Okamoto, Tadao; Komamura, Takeo; and Ishihama, Atsumi, 3,918,445.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Okazaki, Masaki; Hibino, Noburo; and Seto, Kunihira, 3,918,976.
Sato, Akira; Ikeda, Tadashi; Shiba, Keisuke; and Takei, Haruo, 3,918,979.

Fujii, Sakumi: *See—*
Toshimitsu, Itaru; Fujii, Sakumi; and Nakajima, Taketoshi, 3,919,396.

Fujimori, Sigeo: *See—*
Ishizaki, Keizo; and Fujimori, Sigeo, 3,919,517.

Fujitsu Fanuc Limited: *See—*
Usami, Hiroshi; Kohari, Katsuo; and Ishida, Hiroshi, 3,919,608.

Fujitsu Ltd.: *See—*
Usami, Hiroshi; Kohari, Katsuo; and Ishida, Hiroshi, 3,919,608.

Fujiwara, Atushi: *See—*
Ashina, Yoshiro; Yamaguchi, Yasumasa; and Fujiwara, Atushi, 3,918,917.

Fukai, Masakazu: *See—*
Asai, Komei; Moriyama, Akio; Tatsuta, Hiroshi; and Fukai, Masakazu, 3,919,106.

Fukami, Takeshi, to Sony Corporation. Decoding apparatus for reproducing four separate information signals. 3,919,480, Cl. 179-1.0GQ.

Fukasu, Shunichi: *See—*
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.

Fukazawa, Nobuo: *See—*
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,918,953.

Fukui, Shoshin: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,919,361.

Fukui, Takasuke: *See—*
Oshima, Shintaro; Watanabe, Teruji; and Fukui, Takasuke, 3,919,630.

Fullenkamp, Eugene H.: *See—*
Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, 3,919,540.

Fuller Company: *See—*
Anthony, James, 3,918,648.

Furukawa, Junji; Iseda, Yutaka; Haga, Kazuo; and Irako, Koichi, to Bridgestone Tire Company Limited. Method of producing alternating copolymers of donor monomer and acceptor monomer from not less than three monomers. 3,919,180, Cl. 260-80.700.

Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, to Bridgestone Tire Company Limited. Novel acetylene-conjugated diene compound linear random copolymers and a method of production thereof. 3,919,184, Cl. 260-87.50R.

Fusey, Pierre, to Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi". Composition to emulsify mineral oil products in biodegradable form. 3,919,112, Cl. 252-352.000.

Futatsugi, Yuji: *See—*
Takahashi, Akikazu; Futatsugi, Yuji; Yao, Takamu; and Higashide, Yoichi, 3,919,440.

Fyie, Vincent L.: *See—*
Berry, Thomas G.; and Fyie, Vincent L., 3,918,421.

G. D. Searle & Co.: *See—*
Lenz, George R., 3,919,199.

G & H Instrumentation, Inc.: *See—*
Galloway, William C.; and Harrold, William T., 3,919,715.

Gabrielson, Bruce C., to San/Bar Corporation. Telephone instrument disconnect circuit. 3,919,487, Cl. 179-17.00R.

Gadbois, George Simon, to RCA Corporation. Densitometer for measuring average aperture diameter. 3,918,815, Cl. 356-157.000.

Gaensslen, Fritz H.; and Krick, Paul J., to International Business Machines Corporation. Dynamic two device memory cell which provides D.C. sense signals. 3,919,569, Cl. 307-304.000.

GAF Corporation: *See—*
Brachman, Armand Edward, 3,919,166.

Gaffal, Karl; Honold, Ernst; and Martens, Rolf, to Sulzer KSB Kernkraftwerkspumpen GmbH. Cooling means for radial bearings in nuclear reactor pumps or the like. 3,918,689, Cl. 259-105.000.

Gagner, Joseph L. Hinge and setting apparatus therefor. 3,918,122, Cl. 16-137.000.

Gaibler, Dennis W.; and Olson, John E., to Cascade Corporation. Material loader frame construction. 3,918,742, Cl. 280-150.500.

Gaibler, Dennis W.: *See—*
Olson, John E.; and Gaibler, Dennis W., 3,918,741.

Gainesville Machine Company, Inc.: *See—*
Drew, Bernard, Jr., 3,918,587.
Harben, Grover S., Jr., 3,918,123.

Gale, Anthony George: *See—*
Longley, Peter John; and Gale, Anthony George, 3,918,842.

Gall, Rudi: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, 3,919,200.

Galloway, William C.; and Harrold, William T., to G & H Instrumentation, Inc. Event recorder with ratchet tape advance. 3,919,715, Cl. 360-6.000.

Galves, Jean-Pierre; and Merloz, Pierre, to Thomson-CSF. Cathode ray tube screen having both short and long persistence phosphors. 3,919,584, Cl. 313-473.000.

Gambill, Charles C.; and McGavic, John P., to General Motors Corporation. Electronic fuel injection system. 3,918,417, Cl. 123-32.0EA.

Gantley, Francis C., to General Electric Company. System for separating a semiconductor wafer into discrete pellets. 3,918,150, Cl. 29-583.000.

Gantt, James E.: *See—*
Forbes, James T.; and Gantt, James E., 3,918,930.

Garner, Gerald E.: *See—*
Cohen, Arthur L.; Garner, Gerald E.; and Steever, Raymond G. E., Jr., 3,919,553.

Garnier, Jean-Michel A.: *See—*
Person, Jean-Michel; Pays, Gerard J. P.; and Garnier, Jean-Michel A., 3,919,493.

Garrett, Donald E., to Garrett, Donald E. Plural chamber serial flow forced air cooled crystallizer. 3,918,916, Cl. 23-273.0MT.

Garritsen, Johan W.; and Penders, Josef M., to Stamicarbon B.V. Preparation of beta-alkoxy-omega-lactams. 3,919,197, Cl. 260-239.30A.

Garrod, David K.: *See—*
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., 3,919,700.

Gartner, Klaus W.; and Uyeda, Tim M., to Sargent & Greenleaf, Inc. Safe deposit door and lock construction. 3,918,371, Cl. 109-64.000.

Gary, Wildon A. System stabilizer. 3,919,068, Cl. 204-197.000.

Gaschler, Erich, to Volkswagenwerk Aktiengesellschaft. Exhaust gas reactor for a combustion engine. 3,918,258, Cl. 60-305.000.

Gaston, Jack E., to Armstrong Cork Company. Clip means for mounting plastic or metal facing material on building block structures. 3,918,227, Cl. 52-283.000.

Gates Rubber Company, The: *See—*
Coleman, Charles E.; and Hammel, Ronald O., 3,919,618.
Gillman, Leland M.; and Walker, Douglas W., 3,918,989.
Higbee, Charles D., 3,918,499.

Gatsis, John G., to Universal Oil Products Company. Process for the conversion of hydrocarbonaceous black oil. 3,919,074, Cl. 208-48.00R.

Gattuso, Marion J.: *See—*
Arnold, Robert J.; and Gattuso, Marion J., 3,919,225.

Gavrillis, Theofanis G.: *See—*
United States of America, National Aeronautics and Space Administration; Bottoms, Donald J.; and Gavrillis, Theofanis G., 3,919,710.

Gay, James E., to Mobility, Inc. Gooseneck hitch assembly. 3,918,744, Cl. 280-415.00B.

Gay, Michel, to Rhone-Poulenc S.A. Process for the preparation of phenylacetic acid. 3,919,305, Cl. 260-523.00A.

Gaylord, Norman G., to Gaylord Research Institute, Inc. Method for preparing alternating copolymers using a Friedel-Crafts catalyst and a free radical initiator in an aqueous medium. 3,919,182, Cl. 260-85.50R.

Gaylord Research Institute, Inc.: *See—*
Gaylord, Norman G., 3,919,182.

Gebr. Magerle AG: *See—*
Ott, Helmut; and Vlk, Jaroslav, 3,918,429.

Gelbard, Robert B.: *See—*
Summers, Paul E.; and Gelbard, Robert B., 3,918,269.

Gelder, Kenneth M.: *See—*
Wirth, Gary J.; and Gelder, Kenneth M., 3,918,572.

Gema AG Apparatebau: *See—*
Lehmann, Ernst; and Prinzing, Robert, 3,918,641.

Gendreau, Edward E.: *See—*
Cooper, Henry E., III; and Gendreau, Edward E., 3,918,182.

General Dynamics Corporation: *See—*
Smolka, Carl M., 3,919,644.

General Electric Company: *See—*
Acampora, Vincent Paul; and Powell, David Barton, 3,919,674.
Belden, Lorne H., Jr., 3,919,638.
Benz, Mark C., 3,919,002.
Benz, Mark G., 3,919,003.
Benz, Mark G., 3,919,004.
Berninger, Walter H., 3,919,556.
Berninger, Walter H., 3,919,557.
Blake, Walter R., 3,918,751.
Brenig, Theodore, 3,919,633.
Brouillette, Joseph W.; and Leyshon, William E., 3,919,558.
Carson, William N., Jr.; and Niedrach, Leonard W., 3,919,067.

Datta, Ranajit K., 3,919,581.
Degenhart, Thomas Wayne; and De Visser, Christian, 3,919,675.
De Vries, Robert C.; and Fleischer, James F., 3,918,931.
Gantley, Francis C., 3,918,150.
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,919,161.
Hess, Heinrich J., 3,918,991.
Kauders, Herbert J.; and Vincent, Thomas C., 3,919,109.
Koenig, Paul W., 3,919,709.
Lemmers, Eugene, 3,919,579.
Mark, Victor, 3,919,167.
Martin, Donald L., 3,918,933.
McMurray, William; Plunkett, Allan B.; and Stitt, Thomas D., 3,919,620.
Merrill, Duane F.; and Cooke, Richard C., Jr., 3,919,344.
Parks, Harold G.; and Hughes, William C., 3,919,588.
Rocha, Henry A. F., 3,918,297.
Smith, Robert A., 3,919,136.
Summers, Paul E.; and Gelbard, Robert B., 3,918,269.
Supancic, John A., Jr., 3,918,474.
Urkevich, M. P., 3,919,438.
Wentorf, Robert H., Jr.; and Rocco, William A., 3,918,219.
Will, Fritz G.; and Dubin, Robert R., 3,918,992.
Willis, Candler A., Jr., 3,919,595.
Yu, Se Puan; and Tantraporn, Wirojana, 3,919,667.

General Foods Corporation: *See—*
Feldbrugge, Alonzo H. R.; Rankowitz, Marshall M.; and Huste, Arno, 3,919,435.
Mitchell, William A.; and Seidel, William C., 3,919,408.

General Instrument Corporation: *See—*
Gibson, Richard D.; and Whelan, Robert D., 3,918,392.

General Motors Corporation: *See—*
Canter, James A., 3,918,267.
Corry, Thomas M., 3,919,619.
Frier, Frank; Graddy, Willard E.; and Hyden, Daniel W., 3,918,322.
Gambill, Charles C.; and McGavic, John P., 3,918,417.
Hartleroad, Ronald J.; and Grabowski, James P., 3,918,146.
Judd, Richard K., 3,919,366.
Kitchin, Oscar G., 3,918,777.

General Systems: *See—*
Allison, Joseph M., 3,919,616.

Genetti, Ralph A.: *See—*
Trivette, Chester D., Jr.; Vanderkooi, John P.; and Genetti, Ralph A., 3,919,132.

Gent, John Arthur Gooch: *See—*
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,919,127.

GEO Space Corporation: *See—*
Haill, Harry K., 3,919,685.

Geomet, Incorporated: *See—*
Moyer, Rudolph H.; and Sibbett, Donald J., 3,918,908.

Gerard, Jacques: *See—*
Carrasse, Jean; Gerard, Jacques; Pounhet, Pierre; and Martin, Therese, 3,918,516.

Gerber, Heinz Joseph, to Gerber Scientific Instrument Company, The. Apparatus for sensing relative movement of a work table and tool. 3,918,167, Cl. 33-185.00R.

Gerber Scientific Instrument Company, The: *See—*
Gerber, Heinz Joseph, 3,918,167.

Germanas, Dalia; and Pollitzer, Ernest L., to Universal Oil Products Company. Olefin isomerization process. 3,919,341, Cl. 260-683.200.

Gerstenberg, Helmut: *See—*
Walburg, Richard; Gerstenberg, Helmut; and Osterbrink, Hans, 3,918,919.

Gesellschaft fur Steuerungstechnik mbH & Co.: *See—*
Maier, Konrad, 3,918,311.

Gesslein, Georg. Baby carriage. 3,918,759, Cl. 296-28.00B.

Gessner A.G.: *See—*
Maurer, Gottfried, 3,918,633.

Gestetner Byfleet Limited: *See—*
Mihalik, Nandor; and Shreeve, Nicholas Gilbert, 3,918,702.

Getscher, Philip E. Intramedullary hip pin. 3,918,441, Cl. 128-92.0BC.

Gibson, Keith Cyril: *See—*
Skelton, Charles Roger; Marshall, Joseph William; Oxlade, Roy Ronald; and Gibson, Keith Cyril, 3,918,302.

Gibson, Richard D.; and Whelan, Robert D., to General Instrument Corporation. Programmable fiber optic display for use in television tuners. 3,918,392, Cl. 116-124.400.

Giles, Paul M., to United States of America, Energy Research and Development Administration. Method for detection of trichinellae. 3,918,818, Cl. 356-239.000.

Gill, Harnek S.: *See—*
Wadia, Gurinder S.; and Gill, Harnek S., 3,919,523.

Gill, Wendy Rawstron; and Norbury, John, to Imperial Chemical Industries Limited. Fabric bonding process utilizing powdered interpolyamides. 3,919,033, Cl. 156-283.000.

Gillett, Jimmie D., to Unitron Incorporated. AC motor speed control. 3,919,610, Cl. 318-231.000.

Gillman, Leland M.; and Walker, Douglas W., to Gates Rubber Company, The. Flexible electrode plate. 3,918,989, Cl. 136-24.000.

Gilomen, Jerry L., to Restaurant Technology, Inc. Menu and price calculator. 3,918,635, Cl. 235-89.00R.

Gindi, Abraham M.; and Lang, Donald J., to International Business Machines Corporation. Parallel multiplexed loop interface for data transfer and control between data processing systems and subsystems. 3,919,483, Cl. 179-15.0AL.

Gindy Distributing Company: *See—*
Gindy, Irving W.; and Lauterstein, Edwin L., 3,918,266.

Gindy, Irving W.; and Lauterstein, Edwin L., to Gindy Distributing Company. Ice weighing machine. 3,918,266, Cl. 62-137.000.

Giner, Jose D.: *See—*
Lundquist, Joseph Theodore, Jr.; and Giner, Jose D., 3,919,062.

Girdner, William I.; and Miller, John H., III, to Hewlett-Packard Company. Method of making magnetic read-record head. 3,918,152, Cl. 29-603.000.

Girling Limited: *See—*
Farr, Glyn Phillip Reginald, 3,918,768.
Rath, Heinrich Bernhard, 3,918,555.

Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., to General Electric Company. Heat curable polysiloxane compositions containing fibers. 3,919,161, Cl. 260-37.0SB.

Glass Fibres and Equipment Limited: *See—*
Jaray, Francis Ferdinand, 3,918,946.

Glass, Max E.; Donahue, Stephen F.; Urton, John T.; and Carlson, Arthur, Jr., to Bayvet Corporation. Injectable adjuvant and compositions including such adjuvant. 3,919,411, Cl. 424-81.000.

Gleissner, Gerhard: *See—*
Appel, Horst; Bohm, Klaus; and Gleissner, Gerhard, 3,919,634.

Glenoit Mills, Inc.: *See—*
Thore, Thomas J., 3,918,273.

Glick, William C., Jr.; and Witte, Delbert W. Governor device for vehicle accelerator pedal. 3,918,320, Cl. 74-513.000.

Global Marine Inc.: *See—*
Graham, John R.; and Crooke, Robert C., 3,918,380.
McNary, James F.; Hicks, Edward C.; and Ozudogru, Yilmaz H., 3,918,379.

Globe-Union Inc.: *See—*
Hadfield, Raymond George; and Roy, Kenneth Lee, 3,918,391.

Go, Shigeo: *See—*
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, 3,919,185.

Goda, George. Fluid switching apparatus. 3,918,490, Cl. 137-597.000.

Godfrey, Vern L.; and Clark, Bill D. Bale handling machine. 3,918,595, Cl. 214-6.00B.

Godsey, Ernest E.: *See—*
Howlett, Donald L.; Godsey, Ernest E.; and Martin, Carl R., 3,919,657.

Goffe, William L., to Xerox Corporation. Migration imaging method employing a uniform exposure step. 3,918,969, Cl. 96-1.0PS.

Goko, Nobuaki: *See—*
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, 3,919,185.

Goldberg, Morris I. Guard rail safety lock. 3,918,760, Cl. 297-384.000.

Goldco, Industries Inc.: *See—*
VanderMeer, Richard H.; and Simmons, Robert L., 3,918,598.

Goldmark Communications Corporation: *See—*
Benson, Kenneth Blair, 3,919,474.

Goldsmith, Harry. Dispenser nozzle cover. 3,918,616, Cl. 222-504.000.

Golov, Veniamin Grigorievich: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.

Gonzalez, Guillermo Gonzalez, to Refacciones Plasticas y Metalicas, S.A. Self-tightening filter assembly. 3,919,089, Cl. 210-445.000.

Goodew, Carroll D.: *See—*
Clark, Virgil R.; Goodew, Carroll D.; Kueper, Terrance W.; and Price, Byron H., 3,919,565.

Gooding, David N., to International Business Machines Corporation. Asynchronous clocking apparatus. 3,919,695, Cl. 340-172.500.

Goodyear Tire & Rubber Company, The: *See—*
Floto, James E., 3,919,020.
Hampshire, William J., 3,918,762.
Maxey, Frank S., 3,919,179.

Goodyear Tire & Rubber Company of Canada, Ltd., The: *See—*
Gordon, Robert E., 3,919,024.

Goold, Reed; Wojcik, Charles W.; and Cooper, Gerald D., to Herrett, Wilfred H., a part interest. Electrolytic cell. 3,919,070, Cl. 204-222.000.

Goralski, Christian T., to Dow Chemical Company, The. Process for brominating a sulfo acetamide. 3,919,213, Cl. 260-246.00B.

Gordon, Robert E., to Goodyear Tire & Rubber Company of Canada, Ltd., The. Pneumatic tire. 3,919,024, Cl. 156-123.000.

Gordon, Scott C.; and Theodore, Ares N., to Diamond Shamrock Corporation. Preparation of 1,1,2-trichloroethane. 3,919,337, Cl. 260-658.00R.

Gordos, Ambrose L. Putting trainer. 3,918,720, Cl. 273-183.00C.

Goretzki, Jerome A.: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.

Gorlich, Hans: *See—*
Kirschnek, Helmut; and Gorlich, Hans, 3,919,270.

Gould, Robert Kindade, to Aerochem Research Labs., Inc. Catalytic preparation of NO. 3,919,397, Cl. 423-405.000.

Grabarczyk, Joseph E.: *See—*
Schlegel, William L.; Grabarczyk, Joseph E.; and Krihak, Robert J., 3,918,821.

Grabowski, James P.: *See—*
Hartleroad, Ronald J.; and Grabowski, James P., 3,918,146.

Graboyes, Harold: *See—*
Anderson, Elvin L.; and Graboyes, Harold, 3,919,312.

Gracco, Francis: *See—*
Cohen, Georges; Gracco, Francis; and Mikitenko, Paul, 3,919,078.

Graddy, Willard E.: *See—*
Frier, Frank; Graddy, Willard E.; and Hyden, Daniel W., 3,918,322.

Graff, Klaus; and Pieper, Heinrich, to Licentia Patent-Verwaltungs-G.m.b.H. Method for determining the carrier lifetime of a crystal. 3,919,639, Cl. 324-158.00R.

Graham, John R.; and Crooke, Robert C., to Global Marine Inc. Closable well in hull of deep ocean mining vessel. 3,918,380, Cl. 114-0.50D.

Grammer, Don O'Neil: *See—*
Palmer, Nigel Innes; Sugarman, Nathan; and Grammer, Don O'Neil, 3,918,995.

Grams, Guenter A., to Surgical Mechanical Research, Inc. Backflow preventing device. 3,918,477, Cl. 137-218.000.

Grandadam, Jean Andre, to Roussel-UCLAF. Novel zootechnical compositions. 3,919,420, Cl. 424-240.000.

Granges Essem Aktiebolag: *See—*
Waenerlund, Torsten Goran Emil, 3,919,058.

Grant, Charles P., Jr.: *See—*
Cochran, Michael J.; and Grant, Charles P., Jr., 3,919,532.
Cochran, Michael J.; and Grant, Charles P., Jr., 3,919,536.

Gray, Frank H. Wheel mounted display device. 3,918,186, Cl. 40-129.00B.

Gray, George W., to Lutron Electronics Co., Inc. High intensity discharge mercury vapor lamp dimming system. 3,919,592, Cl. 315-199.000.

Graziano, Charles, to Faiveley S.A. Automatic control system for a sliding door. 3,918,201, Cl. 49-28.000.

Greco, Nicholas P., to Koppers Company, Inc. Process for the production of anthraquinone from dihydroanthracene. 3,919,264, Cl. 260-385.000.

Green, Joseph M., to Combustion Engineering, Inc. Flame arrestor. 3,918,889, Cl. 431-346.000.

Greenbarg, Nathan M., to Diego, Joseph, a part interest. Method of making strips of chance tickets. 3,919,032, Cl. 156-252.000.

Greenberg, Jack, to A. H. Robins Company, Incorporated. Pet collar. 3,918,407, Cl. 119-156.000.

Greene, Walter John: *See—*
Fougere, Guy Lloyd; Greene, Walter John; and Jeffreys, Dennis Clifford, 3,918,565.

Greer Hydraulics, Inc.: *See—*
Jacobellis, Alphonse A., 3,918,470.
Noah, Russell V., 3,918,366.
Schon, Otmar, 3,918,497.
Zahid, Abduz, 3,918,693.

Gregg, F. Browne. Gate for fluent material. 3,918,617, Cl. 222-536.000.

Gregory, George P., to Hercules Incorporated. Polyperoxides. 3,919,326, Cl. 260-610.00R.

Gregory, Kenneth H. Machine for rotatable supporting a tank during the manufacture thereof. 3,918,697, Cl. 269-289.000.

Grennan, Charles W., to Chandler Evans Inc. Centrifugal pump with variable impeller. 3,918,831, Cl. 415-131.000.

Greul, Helmut W.: *See—*
Walter, Leo; and Greul, Helmut W., 3,918,788.

Griffin, William Stanley, to Northrop Corporation. Impacting jet aerodynamic window. 3,918,800, Cl. 350-319.000.

Griffin, Zane L.: *See—*
Weber, Ronald A.; Griffin, Zane L.; and Childers, Thomas W., 3,918,485.

Griffith, Robert G.: *See—*
Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., 3,918,284.

Griffiths, David H.: *See—*
Maaghul, John; and Griffiths, David H., 3,918,947.

Grimes, Warren R.; and Bamberger, Carlos E., to United States of America, Energy Research and Development Administration. Thermochemical production of hydrogen. 3,919,406, Cl. 423-648.000.

Grimm, Donald K.; and Totten, Floyd M., to Rockwell International Corporation. Digital vor bearing converter with time averaging. 3,919,706, Cl. 340-347.0AD.

Grinonneau, William C.: *See—*
Kiel, Robert H., deceased; Kiel, Jessie H., administratrix; and Grinonneau, William C., 3,919,150.

Griswold, Douglas A.: *See—*
Wilcox, Harold D.; Griswold, Douglas A.; and Patel, Himanshu M., 3,919,108.

Grossmann, Max; Faber, Ruth; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Dispersing and wetting agents for use in organic biocides. 3,919,429, Cl. 424-358.000.

Grosswendt, Werner, to Rheinmetall G.m.b.H. Launchable missile having a tail unit. 3,918,664, Cl. 244-3.280.

Grushon, Harold N., to Monarch Marking Systems, Inc. Tag feeding and attaching method. 3,918,143, Cl. 29-429.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Crosley, Thomas W.; and Miller, Howard R., 3,919,504.

GTE Laboratories: *See—*
Urban, Michael J., 3,919,055.

GTE Sylvania Incorporated: *See—*
Field, Robert G.; and Wahl, Donn A., 3,919,690.
Hammond, Michael; and Cheresnowsky, Michael, 3,918,977.

Gulf Research & Development Company: *See—*
Lakshmanan, Pallavoor R., 3,919,160.

Gulich, Tore; and Stigmark, Lennaet, to Aktiebolaget Electrolux. Guiding system for landing aircrafts. 3,919,687, Cl. 340-27.0NA.

Gullikkson, Karl Ivar Ake: *See—*
Palm, Bjorn Olov Magnus; Gullikkson, Karl Ivar Ake; and Gustavsson, Bjorn Anders Christer, 3,918,885.

Gumina, Thomas Joseph. Accordion pickup. 3,918,343, Cl. 84-376.0EA.

Gunning, William F.: *See—*
Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., 3,919,696.

Gurevich, Nikolai Alexandrovich: *See—*
Sigal, Isaak Yakovlevich; Naidenov, Georgy Fedorovich; Nizhnik, Sergei Savatievich; and Gurevich, Nikolai Alexandrovich, 3,918,834.

Gurrieri, Joseph V.: *See—*
Cooper, Irving B.; Gurrieri, Joseph V.; and Lord, Michael J., 3,919,528.

Gustavsson, Bjorn Anders Christer: *See—*
Palm, Bjorn Olov Magnus; Gullikkson, Karl Ivar Ake; and Gustavsson, Bjorn Anders Christer, 3,918,885.

Gutfreund, Kurt: *See—*
Wright, Charles Donald; Gutfreund, Kurt; and Brzuskiewicz, John, 3,919,719.

Guth, Eugene Daniel; Helgeson, Norman L.; Arledge, Kenneth W.; and Brienza, Anthony R., to KVB, Inc. Petroleum oil desulfurization process. 3,919,402, Cl. 423-522.000.

Guthrie, Robert William; and Kierstead, Richard Wightman, to Hoffmann-La Roche Inc. Hydroxycitric acid derivatives. 3,919,254, Cl. 260-343.600.

Gutierrez, Eddie N.; and Reardon, Robert C., Jr., to Lever Brothers Company. Process for the preparation of selectively halogenated ketones and ketals. 3,919,328, Cl. 260-615.00A.

Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for adjusting the phase state of a timing signal. 3,919,647, Cl. 328-155.000.

Habiger, Cyril W.; and Hopkins, Donald L., to Caterpillar Tractor Company. Horsepower-limiting valve and linkage therefor. 3,918,259, Cl. 60-445.000.

Habock, Adolf; and Holtz, Joachim, to Siemens Aktiengesellschaft. Apparatus for damping oscillations in a track-bound propulsion vehicle having a synchronous linear motor. 3,919,607, Cl. 318-135.000.

Habulak, Edward Paul, to M & T Chemicals Inc. Zinc plating process and electrolytes therefor. 3,919,056, Cl. 204-55.00R.

Hackenberg, Robert A., to Robertson Paper Box Co., Inc. Decorator box. 3,918,631, Cl. 229-37.000.

Hada, Haruki: *See—*
Kiyonaga, Kingo; and Hada, Haruki, 3,918,928.

Hadfield, Raymond George; and Roy, Kenneth Lee, to Globe-Union Inc. Mode indicator for slider element. 3,918,391, Cl. 116-124.00L.

Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, to Hoechst Aktiengesellschaft. 14,15β-Epoxycardenolide- and 14,15β-epoxybufadienolide-glycosides and process for their preparation. 3,919,191, Cl. 260-210.500.

Haffner, Donald G.; Meyer, Dean A.; Ecker, Franklin A.; and Akgulian, Sahag C., to Jacobsen Manufacturing Company. Hydraulic system for a gang lawn mower. 3,918,240, Cl. 56-7.000.

Haga, Kazuo: *See—*
Furukawa, Junji; Iseda, Yutaka; Haga, Kazuo; and Irako, Koichi, 3,919,180.

Hagelstam, Clas Hjalmar, to Oy. Karl Fazer AB. Screen device for pneumatic transport equipment. 3,918,585, Cl. 209-3.000.

Hagen, Helmut; and Hansen, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Monoazo dyes of the benzisothiazole series which are not soluble in water. 3,919,188, Cl. 260-158.000.

Hahn, Ernest A., to PPG Industries, Inc. Method of producing flat (non-glossy) films. 3,918,393, Cl. 427-38.000.

Hahn, Helmut: *See—*
Schmalfeld, Paul; Hahn, Helmut; Lehmann, Joachim; and Kleisa, Kurt, 3,918,929.

Haigh, Daniel H.: *See—*
Hall, Richard H.; Haigh, Daniel H.; Archer, Wesley L.; and West, Peter, 3,919,335.

Haill, Harry K., to GEO Space Corporation. Seismic data acquisition system and method. 3,919,685, Cl. 340-15.5GC.

Halder, Niklaus, to Hoffmann-La Roche Inc. Preparation of isomorphinan derivative. 3,919,237, Cl. 260-285.000.

Hale Fire Pump Company: *See—*
Eberhardt, H. Alfred, 3,918,681.

Halem, Norman. System for employing the change of momentum during vehicle deceleration for accessory power. 3,918,543, Cl. 180-77.00R.

Hall, Richard H.; Haigh, Daniel H.; Archer, Wesley L.; and West, Peter, to Dow Chemical Company, The. Stabilization of chloroaromatics. 3,919,335, Cl. 260-651.00R.

Halliburton Company: *See—*
Broaddus, Gene C.; and Fredrickson, Sherman E., 3,918,524.

Halliger, Leonhard; and Schroder, Horst, to SKF Industrial Trading and Development Company B.V. System for securing roller bearings. 3,918,779, Cl. 308-236.000.

Halstead Industries, Incorporated: *See*—
Nussbaum, Otto J., 3,918,268.

Hamada, Osamu, to Sony Corporation. FM receiver noise suppression circuit. 3,919,482, Cl. 179-15.0BT.

Hammel, Ronald O.: *See*—
Coleman, Charles E.; and Hammel, Ronald O., 3,919,618.

Hammond, Michael; and Cheresnowsky, Michael, to GTE Sylvania Incorporated. Method for coating metallic strips. 3,918,977, Cl. 96-86.00R.

Hammonds, James C.: *See*—
Campbell, George C.; Hammonds, James C.; and Rollins, Dallas W., 3,918,370.

Hamprecht, Gerhard, to BASF Aktiengesellschaft. Betahaloalkylaminosulfonyl halides and their production. 3,919,308, Cl. 260-543.00R.

Hamprecht, Gerhard: *See*—
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,919,282.

Hampshire, William J., to Goodyear Tire & Rubber Company, The. Vehicle wheel cover. 3,918,762, Cl. 301-37.00P.

Hanak, Joseph John, to RCA Corporation. Electroluminescent cell with a current-limiting layer of high resistivity. 3,919,589, Cl. 315-71.000.

Handelsbolaget Broderna Backman: *See*—
Backman, Rolf, 3,918,410.

Hands, Clifford Henry George, deceased; by Hands, Joan, legal representative; and by Watson, Donald, legal representative, to Albright & Wilson Limited. Distillation of chloroxylenes. 3,919,054, Cl. 203-6.000.

Hands, Joan, legal representative: *See*—
Hands, Clifford Henry George, deceased; Hands, Joan, legal representative; and Watson, Donald, legal representative, 3,919,054.

Hansen, Guenter: *See*—
Hagen, Helmut; and Hansen, Guenter, 3,919,188.

Hansen Manufacturing Company, The: *See*—
Karcher, Thomas D.; and Kourah, Aly A., 3,918,492.

Hansen, Robert A.: *See*—
Moon, Warren D.; Weiner, Richard J.; Hansen, Robert A.; and Linde, Robert N., 3,919,479.

Hara, Kunio, to Nifco Inc. Plastic tying band. 3,918,129, Cl. 24-16.0PB.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Apparatus for stunning fowl. 3,918,123, Cl. 17-11.000.

Hardt, Lothar, to Metallgesellschaft Aktiengesellschaft. Electrostatic precipitator composed of synthetic resin material. 3,918,939, Cl. 55-155.000.

Hardtmann, Goetz E., to Sandoz Inc. N-cycloalkyl and N-cycloalkylalkyl isatoic anhydrides. 3,919,210, Cl. 260-244.00A.

Harman International Industries, Inc.: *See*—
Mills, John E., 3,918,319.

Harms, Horst; and Kunsch, Hans-Jurgen, to Aktiengesellschaft "Weser". Winch assembly. 3,918,653, Cl. 242-54.00R.

Harris, Edmond H. Material removal attachment for a rotary mower. 3,918,242, Cl. 56-16.700.

Harris, Frank L., to Norris Industries, Inc. Wheel trim. 3,918,763, Cl. 301-37.00B.

Harris-Intertype Corporation: *See*—
Friesem, Albert A., 3,918,803.
Macey, Keith S.; and Marciniak, John J., 3,918,336.
Southam, Donald L.; and Seel, Howard J., 3,918,363.

Harrold, William T.: *See*—
Galloway, William C.; and Harrold, William T., 3,919,715.

Hart, Lewis Frederick; and Buttle, Robert Leroy, to RCA Corporation. Black ceramic body. 3,918,982, Cl. 106-46.000.

Hartemann, Pierre, to Thomson-CSF. Surface wave transducer array and acousto-optical deflector system or frequency-selective transmission system, utilizing the same. 3,919,669, Cl. 333-30.00R.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Magnetic semiconductor device bonding apparatus with vacuum-biased probes. 3,918,146, Cl. 29-569.000.

Hartog, Thomas J., to Browning Arms Company. Indexing system for revolvers. 3,918,189, Cl. 42-67.000.

Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., to System Development Corporation. Method and apparatus for scrambling and unscrambling communication signals. 3,919,462, Cl. 178-5.100.

Hartwell Corporation: *See*—
Poe, L. Richard, 3,918,130.

Hasala, Ernest. Animated display. 3,918,185, Cl. 40-106.530.

Hashimoto, Mitiyoshi: *See*—
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Hasker, Jan; and De Klerr, Jacobus Johannes Maria Joseph, to U.S. Philips Corporation. Electron gun with grid and anode having orthogonal elongated apertures. 3,919,583, Cl. 313-448.000.

Hatada, Michio. Can capable of being folded into a definite form by hand. 3,918,603, Cl. 220-1.00R.

Hattori, Takeo; Hoya, Yoshio; and Maeda, Atsushi, to Mitsubishi Petrochemical Co., Ltd. Process for extruding thermoplastic resin composition containing a high inorganic filler content. 3,919,164, Cl. 260-42.000.

Hattori, Yasuzo; and Niizuma, Jiro, to Kabo Kogyo Co. Ltd. Fire-extinguishing device. 3,918,526, Cl. 169-51.000.

Hattwig, Peter; and Munchenberg, Gunter, to Volkswagenwerk Aktiengesellschaft. Method and apparatus for signaling brake lining wear of a brake. 3,918,553, Cl. 188-1.00A.

Hauge, Douglas O., to United States Gypsum Company. Process for extraction of phosphorus compounds. 3,919,395, Cl. 423-309.000.

Haupt, Robert C., to Allis-Chalmers Corporation. Removable side panel. 3,918,540, Cl. 180-69.00R.

Hauser, Raimund: *See*—
Bauhofer, Friedrich, 3,918,801.

Haviv, Fortuna: *See*—
Patchornik, Abraham; and Haviv, Fortuna, 3,919,206.
Patchornik, Abraham; and Haviv, Fortuna, 3,919,208.

Havranek, Drahomir F., to Western Electric Company. Pulse corrector. 3,919,486, Cl. 179-16.0EA.

Hawker, Michael John; and Poole, Dennis Frederick, to Rabone Chesterman Limited. Tape reel. 3,918,657, Cl. 242-84.800.

Hawley Manufacturing Corporation: *See*—
Overmyer, Robert C., 3,918,691.

Haworth, Lional; Foweraker, David Bruce; and Foster, Richard Armstrong, to Rolls-Royce (1971) Limited. Compressor for gas turbine engines. 3,918,840, Cl. 416-190.000.

Hay, David Gilbert: *See*—
Fox, Richard; and Hay, David Gilbert, 3,919,013.

Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, to Sanki Engineering Co., Ltd.; and Mitsui Petrochemical Industry Co., Ltd. Device for eliminating an adherent substances in the industrial waste incinerator. 3,918,375, Cl. 110-14.000.

Hayamizu, Yoshisada; and Kanehira, Katsuyuki, to Olympus Optical Co., Ltd. Endoscope capable of changing over the directions of visual field. 3,918,438, Cl. 128-4.000.

Hayashi, Masataka: *See*—
Matsumura, Sakujiro; Yamamura, Tadashi; Ogura, Akira; and Hayashi, Masataka, 3,918,245.

Hayashi, Yutaka: *See*—
Tarui, Yasuo; Sekigawa, Toshihiro; and Hayashi, Yutaka, 3,919,006.
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,919,007.

Hayashida, Yoshihiro, to Tokico Ltd. Pressure control valve for vehicle braking system. 3,918,765, Cl. 303-6.00R.

Haydon, Arthur W., to Tri-tech, Inc. Digital clock or other counting device with resilient coupling means in the drive train. 3,918,252, Cl. 58-125.00C.

Hayes, John C., to Universal Oil Products Company. Hydrocarbon isomerization process. 3,919,340, Cl. 260-683.200.

Hayes, William H.; and McConnell, David P., to Reliance Instrument Manufacturing Corporation. Smoke detector. 3,919,702, Cl. 340-237.00S.

Hays, Kenneth Scott, to AMP Incorporated. Battery terminal device. 3,918,787, Cl. 339-19.000.

Hayward, Walter W., to Fawn Hollow Corporation. Awning assemblies. 3,918,510, Cl. 160-45.000.

Hazelbaker, Harold J.: *See*—
Bedner, Michael P., 3,918,471.

Hazleton Laboratories, Inc.: *See*—
Forsythe, Alan K., 3,918,727.

Health Kit Corporation: *See*—
Morgan, Ward; Weiner, Gerald H.; and Raff, Ronald D., 3,918,161.

Healy, James C.: *See*—
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,919,358.

Heard, Allen C., to United States Steel Corporation. High volume hydraulic recoil pump. 3,918,845, Cl. 417-260.000.

Heaton, Joe. Driver training signaling device. 3,918,175, Cl. 35-11.000.

Hebel Gasbetonwerk GmbH: *See*—
Vogele, Josef, 3,919,372.

Hechenbleickner, Ingenuin, to Borg-Warner Corporation. Stabilized polyvinyl chloride compositions. 3,919,165, Cl. 260-45.75K.

Heck, Lyle D.: *See*—
Williams, Allan L.; and Heck, Lyle D., 3,919,704.

Heden, Carl-Goran. Method to divert heat generated in an electrophoretical separation especially isoelectric focusing and isotachophoresis. 3,919,065, Cl. 204-180.00G.

Heidenreich & Harbeck Zweingniederlassung der Gildemeister AG: *See*—
Rose, Peter, 3,918,876.

Heilhecker, Joe K., to Exxon Production Research Company. Apparatus for maintaining an electric conductor in a drill string. 3,918,537, Cl. 175-320.000.

Heiman, Fred P.; and Herzog, Gerhard, to Mars, Inc. Method and apparatus for use in an inductive sensor coin selector. 3,918,564, Cl. 194-100.00A.

Heinrich Koppers GmbH: *See*—
Stanke, Walter; and Mertens, Gottfried, 3,918,894.

Heitmann, Guenter. Method for the production of sponge iron. 3,918,958, Cl. 75-13.000.

Hejno, Karel; Slama, Karel; and Sorm, Frantisek, to Ceskoslovenska akademie ved. 9-(2-Tetrahydrofuryl)-2-nonenoic acid and 9-(2-tetrahydrofuryl)-2,4-nonadienoic acid and esters. 3,919,260, Cl. 260-347.400.

Helgeson, Norman L.: *See*—
Guth, Eugene Daniel; Helgeson, Norman L.; Arledge, Kenneth W.; and Brienza, Anthony R., 3,919,402.

Hellqvist, Ake O. W., to AB Sundsvalls Specialprodukter. Method and apparatus for natural biochemical decomposition of latrine. 3,918,106, Cl. 4-120.000.

Henderson, Albert J.; and Krol, John E., to Neville Chemical Company. Improved process for the liquid phase chlorination of C_9–C_{18} paraffin hydrocarbons. 3,919,338, Cl. 260-660.000.

Hendrickson, Kenneth E.: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.

Henkel & Cie G.m.b.H.: *See—*
Eckert, Hans-Werner; Nikolaus, Peter; and Schwarzer, Johann, 3,919,091.
Heyden, Rudi; and Eckelt, Michael, 3,919,111.
Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, 3,919,045.
Kuhling, Dieter; and Bloching, Helmut, 3,919,102.
Schindler, Norbert; and Ploger, Walter, 3,919,296.

Hennells, Ransom J.; and Scothorn, Thomas R., to Compactor Company, Inc. Waste compactor with adjustable bag fill control. 3,918,359, Cl. 100-52.000.

Hennig, Fridolin: *See—*
Winkler, Alfred; Hennig, Fridolin; and Albrecht, Dieter, 3,919,539.

Henrick, Clive A.: *See—*
Anderson, Richard J.; and Henrick, Clive A., 3,919,329.

Herbertz, Joachim, to Raimar Pohlman. Method of nondestructively testing materials by ultrasound. 3,918,295, Cl. 73-67.700.

Herbold, Werner R., to Blanc & Co. Article of manufacture and manufacturing of such article. 3,918,377, Cl. 113-120.00B.

Hercules Incorporated: *See—*
Gregory, George P., 3,919,326.
Kim, Charles W., 3,918,135.

Herczog, Andrew, to Corning Glass Works. Hermetic enclosure for electronic component. 3,918,147, Cl. 29-570.000.

Hering, Klaus: *See—*
Volker, Theodor; Hering, Klaus; and Dallwigk, Edouard, 3,919,236.

Herman, Richard M.: *See—*
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,919,358.

Hermstein, Wolfgang, to Siemens Aktiengesellschaft. Measuring transformer arrangement. 3,919,626, Cl. 323-93.000.

Herrett, Wilfred H.: *See—*
Goold, Reed; Wojcik, Charles W.; and Cooper, Gerald D., 3,919,070.

Herrin, Marley Ann; and Short, James Harold, to Abbott Laboratories. Accelerating the lysis of blood clots. 3,919,414, Cl. 424-94.000.

Herrmann, Wolfgang Dieter; Stoss, Peter Johannes; and Satzinger, Gerhard, to Warner-Lambert Company. Preparation of free sulfoximines by hydrolysis of N-(ortho- and para-nitrobenzoyl)-sulfoximines. 3,919,310, Cl. 260-551.00S.

Hershberg, Emanuel B.: *See—*
Manero, Carlos; Escobar, Miguel; Hershberg, Emanuel B.; and Herzog, Hershel L., 3,918,200.

Herzog, Gerhard: *See—*
Heiman, Fred P.; and Herzog, Gerhard, 3,918,564.

Herzog, Hershel L.: *See—*
Manero, Carlos; Escobar, Miguel; Hershberg, Emanuel B.; and Herzog, Hershel L., 3,918,200.

Hess, Heinrich J., to General Electric Company. Sodium-halogen battery. 3,918,991, Cl. 136-83.00R.

Hess, Patrick H., to Chevron Research Company. Catalyst for the setting of an acid-settable liquid in a terrestrial zone. 3,919,104, Cl. 252-188.30R.

Heterochemical Corporation: *See—*
Nooi, Jacobus, 3,919,426.

Hewlett-Packard Company: *See—*
Girdner, William I.; and Miller, John H., III, 3,918,152.
Tung, Chung C., 3,919,694.

Heyden, Rudi; and Eckelt, Michael, to Henkel & Cie G.m.b.H. Agents and method for foam control. 3,919,111, Cl. 252-321.000.

Hibino, Noburo: *See—*
Arai, Atsuaki; Okazaki, Masaki; Hibino, Noburo; and Seto, Kunihira, 3,918,976.

Hickman, Albert F., to Hickman Developments, Inc. Tandem axle spring suspension and method of making same. 3,918,736, Cl. 280-104.50R.

Hickman Developments, Inc.: *See—*
Hickman, Albert F., 3,918,736.

Hicks, Edward C.: *See—*
McNary, James F.; Hicks, Edward C.; and Ozudogru, Yilmaz H., 3,918,379.

Hideshima, Yasuhiro, to Sony Corporation. Memory circuit. 3,919,699, Cl. 340-173.0CA.

Higashide, Yoichi: *See—*
Takahashi, Akikazu; Futatsugi, Yuji; Yao, Takamu; and Higashide, Yoichi, 3,919,440.

Higbee, Charles D., to Gates Rubber Company, The. Hose. 3,918,499, Cl. 138-125.000.

Higbee, James H. Gummed tape dispenser. 3,918,338, Cl. 83-449.000.

Higginbottom, Harold P., to Monsanto Company. Thermal insulation of mineral fiber matrix bound with phenolic resin. 3,919,134, Cl. 260-7.000.

High, Gerald S.; and Dhake, Bhimashanker G., to M & T Chemicals Inc. Coating composition. 3,918,984, Cl. 106-290.000.

Hill, Frank: *See—*
Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, 3,919,045.

Hill, Harlan F.; and Lafferty, John J., to SmithKline Corporation. β-Naphthylmethyl piperazinyl derivatives. 3,919,230, Cl. 260-256.40N.

Hill-Rom Company, Inc.: *See—*
Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, 3,919,540.

Hiller, Heinrich: *See—*
Schuhmacher, Alfred; Hiller, Heinrich; and Redeker, Joerg, 3,919,303.

Hillman, Thomas F.: *See—*
Anderson, Elmer L.; and Hillman, Thomas F., 3,918,871.

Hillner, Rudolf E.; Strouse, David, Jr.; and Hoch, Lou, to Champion-Edison, Inc. Web-splicing apparatus. 3,918,655, Cl. 242-58.100.

Hilti Aktiengesellschaft: *See—*
Jochum, Peter; and Benz, Gottfried, 3,918,621.
Maier, Elmar, 3,918,620.
Schmuck, Peter, 3,919,573.
Schmuck, Peter, 3,919,574.

Himmele, Walter; Hoffmann, Werner; Pasedach, Heinrich; and Aquila, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Alkan-1-al-7-ols. 3,919,324, Cl. 260-602.000.

Hintermeier, Karl; Trosken, Otto; and Wirth, Siegfried, to Cassella Farbewerke Mainkur Aktiengesellschaft. Quaternary ammonium chlorides. 3,919,319, Cl. 260-567.60M.

Hiraiwa, Takashi, to Nikken Chemicals Co., Ltd. Composite maltitol powder. 3,918,986, Cl. 127-29.000.

Hirakawa, Michio: *See—*
Yamaguchi, Tadashi; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,919,178.

Hirano, Koji: *See—*
Sato, Hiroki; Saito, Toseki; Hirano, Koji; and Takahashi, Hiroh, 3,919,587.

Hirata, Hidekazu; and Sakai, Siro, to Sumitomo Chemical Company, Limited. Process for producing acrylamide polymers in an acetone-water solvent system. 3,919,140, Cl. 260-17.00A.

Hironaka, Toru: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.

Hirose, Yutaka; and Yoshimura, Shigetake, to Toyo Kogyo Co., Ltd. Exhaust gas purifying device for an internal combustion engine. 3,918,257, Cl. 60-284.000.

Hitachi, Ltd.: *See—*
Anzai, Masayasu, 3,918,970.
Iwamatsu, Seiichi, 3,919,008.
Kameyama, Tadao; and Watanabe, Akinori, 3,918,552.
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.
Mimata, Tsutomu; and Yuzawa, Ryozo, 3,918,144.
Takahashi, Tadashi; and Onishi, Kazuo, 3,919,611.
Ueno, Sadayasu; and Hosho, Yukio, 3,919,680.
Yumde, Yasufumi; Narita, Sho; Murai, Mikio; and Kubota, Takashi, 3,919,716.

Hitachi Metals, Ltd.: *See—*
Kiyonaga, Kingo; and Hada, Haruki, 3,918,928.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
Shindo, Masatoshi; Tsuchiya, Shiro; and Takegami, Kazuo, 3,918,892.

Hitzel, Volker: *See—*
Weyer, Rudi; Aumuller, Walter; Hitzel, Volker; and Schmidt, Felix Helmut, 3,919,245.

Hoch, Lou: *See—*
Hillner, Rudolf E.; Strouse, David, Jr.; and Hoch, Lou, 3,918,655.

Hochgesand, Gerhard: *See—*
Kriebel, Manfred; and Hochgesand, Gerhard, 3,918,934.

Hoechst Aktiengesellschaft: *See—*
Grossmann, Max; Faber, Ruth; and Uhrig, Heinz, 3,919,429.
Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, 3,919,191.
Katsimbas, Themistoklis, 3,919,346.
Katsimbas, Themistoklis, 3,919,347.
Ong, Sienling; Diery, Helmut; and Weyer, Hans-Jurgen, 3,918,900.
von der Eltz, Hans-Ulrich; Lehinant, Armand; and Maier, Hans-Peter, 3,918,897.
Walburg, Richard; Gerstenberg, Helmut; and Osterbrink, Hans, 3,918,919.
Weyer, Rudi; Aumuller, Walter; Hitzel, Volker; and Schmidt, Felix Helmut, 3,919,245.

Hoehn, Harold J.; and Ernsthausen, Roger E., to Owens-Illinois, Inc. Multiple gaseous discharge display/memory panel having thin film dielectric charge storage member. 3,919,577, Cl. 313-201.000.

Hoerner Waldorf Corporation: *See—*
Faller, Rudolph A., 3,918,608.

Hoff, Seymour; Kehr, Sharon A.; and Pharriss, Bruce B., to ALZA Corporation. Apparatus for inserting an intrauterine device. 3,918,444, Cl. 128-130.000.

Hoff-Stevens, Inc.: *See—*
Stevens, Frederick F., Jr., 3,918,680.

Hoffman, Boguslaw: *See—*
Zmojdzin, Andrzej; and Hoffman, Boguslaw, 3,919,223.

Hoffmann, Jay: *See—*
Evans, John L.; Ferriss, Lincoln S.; and Hoffmann, Jay, 3,918,310.

Hoffmann-La Roche Inc.: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,919,322.

Edenhofer, Albrecht; and Spiegelberg, Hans, 3,919,311.
Fergason, James L., 3,918,796.
Guthrie, Robert William; and Kierstead, Richard Wightman, 3,919,254.
Halder, Niklaus, 3,919,237.
Kyburz, Emilio; and Spiegelberg, Hans, 3,919,321.
Pauling, Horst, 3,919,250.
Sigdell, Jan-Erik; and Buser, Martin, 3,919,455.

Hoffmann, Werner: *See—*
Himmele, Walter; Hoffmann, Werner; Pasedach, Heinrich; and Aquila, Werner, 3,919,324.

Hofmann, Rudolf; and Klemmer, Herbert, to Dr. -Ing. H. c. F. Porsche Aktiengesellschaft. Wheel Suspension for motor vehicles. 3,918,737, Cl. 280-124.00B.

Hofmeister, Helmut: *See—*
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.

Holden, Abe N., to Westinghouse Electric Corporation. Ceramic-lined combustion chamber and means for support of a liner with combustion air penetrations. 3,918,255, Cl. 60-39.650.

Holden, Herbert K., to American Filtrona Corporation. Method of manufacturing a self-contained low pressure drop filter. 3,919,369, Cl. 264-45.100.

Holler, George J., Jr. Pollution abatement system. 3,918,915, Cl. 23-262.000.

Holleran, Louis M.: *See—*
Cantaloupe, Francis A.; Frost, Rodney I.; and Holleran, Louis M., 3,919,384.

Holloway, John G.; and Barch, Herbert W., to PPG Industries, Inc. Particulate lead trap. 3,918,936, Cl. 55-97.000.

Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, to PPG Industries, Inc. Particulate lead trap system. 3,918,937, Cl. 55-97.000.

Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, to PPG Industries, Inc. Particulate lead trap system. 3,918,943, Cl. 55-337.000.

Holloway, John G.; and Barch, Herbert W., to PPG Industries, Inc. Particulate lead trap. 3,918,945, Cl. 55-350.000.

Holm, Dale M., to United States of America, Energy Research and Development Administration. Diagnoses of disease states by fluorescent measurements utilizing scanning laser beams. 3,918,812, Cl. 356-73.000.

Holman, Benedictus Timotheus Johannes, to U.S. Philips Corporation. Gauze supply conductor in coil unit for a television camera tube. 3,919,586, Cl. 315-8.000.

Holmes, Jerry D.: *See—*
Allen, Robert P.; and Holmes, Jerry D., 3,919,255.

Holtkamp, Donald A.: *See—*
Chichester, Willard L.; and Holtkamp, Donald A., 3,918,546.

Holtmann, Wilhelm: *See—*
Hubers, Gerd-Jan; and Holtmann, Wilhelm, 3,918,687.

Holtz, Joachim: *See—*
Habock, Adolf; and Holtz, Joachim, 3,919,607.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Honda, Ko, to Rank Xerox Ltd. Corona discharge apparatus. 3,919,605, Cl. 317-262.00A.

Honeywell Inc.: *See—*
Abens, Sandors G., 3,918,988.
Anderson, George A., 3,919,693.
Dukich, Peter P.; Lechevalier, Robert L.; and Volk, John A., 3,919,475.
Koch, Robert B.; Nelson, Leroy D.; and Rork, Gerald D., 3,919,051.

Honold, Ernst; and Rupp, Michael, to Klein, Schanzlin * Becker Aktiengesellschaft. Centrifugal pump assembly for use in nuclear reactor plants or the like. 3,918,272, Cl. 64-23.000.

Honold, Ernst: *See—*
Gaffal, Karl; Honold, Ernst; and Martens, Rolf, 3,918,689.

Hooks, Haywood, Jr.: *See—*
Scott, Robert N.; and Hooks, Haywood, Jr., 3,919,298.

Hoover, Edward D.: *See—*
Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., 3,919,696.

Hoover, William J.: *See—*
Tsen, Cho C.; and Hoover, William J., 3,919,434.

Hopkins, Donald L.: *See—*
Habiger, Cyril W.; and Hopkins, Donald L., 3,918,259.

Hopkinson, Paul O. W., to St. Barnabas Free Home, a part interest. Spark plug gap adjuster. 3,918,329, Cl. 81-3.00R.

Horiki, Seinosuke. Panel-styled calorific devices and a process for manufacturing the same. 3,919,441, Cl. 428-426.000.

Horiuchi, Tadanori: *See—*
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Horn, Anton James, to Sybron Corporation. Constant current electrotherapy device with plug-in current control means. 3,918,459, Cl. 128-419.00R.

Horn, Norman E., to Brunswick Corporation. Marine engine cooling system employing a thermostatic valve means and a pressure relief valve means. 3,918,418, Cl. 123-41.080.

Hornbeck, Eugene K. Method for illuminating organic fishing baits. 3,918,190, Cl. 43-4.500.

Horrocks, Brian J.: *See—*
Metcalfe, Kenneth A.; Clements, Alwin S.; and Horrocks, Brian J., 3,918,966.

Horster, Horst; Pusschert, Walter Alfred; Schweppe, Heinz; and Czarnojan, Wolfram, to U.S. Philips Corporation. Piezoelectric flash-bulb ignition device. 3,919,570, Cl. 310-8.700.

Horzick, Joseph, to Motorola, Inc. Display packaging arrangement for articles of manufacture. 3,918,577, Cl. 206-45.340.

Hoshi, Hiroshi: *See—*
Yamaguchi, Tadashi; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,919,178.

Hosho, Yukio: *See—*
Ueno, Sadayasu; and Hosho, Yukio, 3,919,680.

Hosmer/Dorrance Corporation: *See—*
Breakey, James W.; Freter, John M.; and Wren, Jack, 3,918,103.

Hosoe, Kazuya: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 3,918,802.

Hosoe, Satosi: *See—*
Kida, Kihachi; Akane, Takahiro; Hosoe, Satosi; and Sugita, Tadashi, 3,918,326.

Hoster, Hansruedi; and Markert, Jurgen, to Ciba-Geigy AG. Dyeing of synthetic organic material with aliphatic and halogenated aliphatic solution. 3,918,902, Cl. 8-174.000.

Hostetler, Eldon, to Chore-Time Equipment, Inc. Weight-controlled recirculating feeding apparatus and method. 3,918,405, Cl. 119-52.0AF.

Houle, Roland J. Blind scriber. 3,918,162, Cl. 33-41.00R.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Acyl substituted dibenzylethers. 3,919,323, Cl. 260-592.000.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Acyl substituted phenyl alkanoic acids. 3,919,309, Cl. 260-515.

Hounsfield, Godfrey Newbold, to EMI Limited. Method of and apparatus for examining a body by radiation such as X or gamma radiation. 3,919,552, Cl. 250-360.000.

Howell Laboratories, Incorporated: *See—*
Villaume, Henry F., 3,918,868.

Howett, Michael John: *See—*
Becker, William Gene; Bruder, Frank Joseph; and Howett, Michael John, 3,919,505.

Howlett, Donald L.; Godsey, Ernest E.; and Martin, Carl R., to Texaco Inc. Wide dynamic range amplifier system with slew rate control. 3,919,657, Cl. 330-51.000.

Hoya Glass Works, Ltd.: *See—*
Kitayama, Teruki; Takahara, Hiroaki; and Ogawa, Hiroshi, 3,918,951.

Hoya, Yoshio: *See—*
Hattori, Takeo; Hoya, Yoshio; and Maeda, Atsushi, 3,919,164.

Huber, Frank J. Weed puller. 3,918,757, Cl. 294-50.900.

Huber, Ludwig Konrad, to Pennwalt Corporation. Process for controlling microorganisms with tetrahydro-1,3-thiazinium salts. 3,919,422, Cl. 424-246.000.

Huber, Max; and Schutz, Gerhard, to Sulzer Brothers Limited. Static mixing device. 3,918,688, Cl. 259-4.000.

Huber, Paul W.: *See—*
Cullen, John S.; and Huber, Paul W., 3,918,578.

Hubers, Gerd-Jan; and Holtmann, Wilhelm. Structure for encapsulating articles with viscous compositions such as casting resins. 3,918,687, Cl. 259-4.000.

Hubler, Lawrence C.: *See—*
Koch, Gilbert E.; and Hubler, Lawrence C., 3,918,705.

Huch, Albert: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 3,918,434.

Hudson Engineering Corporation: *See—*
James, Opal R., 3,918,518.

Huff, Ralph H.; and Lee, Henry L., Jr. Tetraazomethines. 3,919,317, Cl. 260-566.00R.

Hughes Aircraft Company: *See—*
Evans, Norol T., 3,919,707.
Templin, Lawrence R., 3,919,643.

Hughes, Benjamin F. Rotary motor. 3,918,414, Cl. 123-8.270.

Hughes Tool Company: *See—*
Bender, Mark Leslie, 3,918,538.

Hughes, William C.: *See—*
Parks, Harold G.; and Hughes, William C., 3,919,588.

Hugin Kassaregister AB: *See—*
Lundstrom, Goran Ingemar; and Andersson, Oswald Karl Gustav, 3,918,656.

Hull, Donald A., to Allen Group, Inc., The. Acoustical vehicle dryer. 3,918,171, Cl. 34-243.00C.

Hull, Ezekiel H.: *See—*
McIntosh, Robert H.; and Hull, Ezekiel H., 3,919,410.

Hulle, Robert M.; Ferrero, John; and Pannullo, Gerard, to Trans-Can Industries, Inc. Encoder for altimeters and the like instruments. 3,918,307, Cl. 73-387.000.

Hunting, Robert A.; and Van Ness, Bradford O., to Engineered Systems, Inc. Data transmission system. 3,919,461, Cl. 178-2.00R.

Hurletron Altair: *See—*
Coberley, Daniel A., 3,919,561.

Huste, Arno: *See—*
Feldbrugge, Alonzo H. R.; Rankowitz, Marshall M.; and Huste, Arno, 3,919,435.

Hutchison, Stanley O., to Chevron Research Company. Wire line inflatable packer apparatus. 3,918,520, Cl. 166-64.000.

Hutson, Maurice L.; and Erben, Kurt, to Control Data Corporation. Data processing system. 3,919,534, Cl. 235-156.000.

Huwyler, Franco; and Engele, Horst, to Fabbrica Italiana Magneti Marelli, S.p.A. Manual diagnosis equipment for motor vehicles. 3,919,466, Cl. 178-6.800.

Hwa, Stephen C. P., to Xerox Corporation. Cleaning blade for photocopier. 3,918,807, Cl. 355-15.000.

Hwa, Stephen C. P., to Xerox Corporation. Apparatus for cleaning a surface support. 3,918,809, Cl. 355-15.000.

Hy-Gain Electronics Corporation: *See—*
Morgan, Eugene L., 3,919,646.

Hyatt, Hugh M.: *See—*
Mooney, Leonard J.; and Hyatt, Hugh M., 3,919,580.

Hyba, Raymond Theodore, to Allied Chemical Corporation. Safety knife. 3,918,157, Cl. 30-287.000.

Hybarger, Kenneth Charles, to International Telephone and Telegraph Corporation. Parking brake control assembly. 3,918,321, Cl. 74-516.000.

Hyden, Daniel W.: *See—*
Frier, Frank; Graddy, Willard E.; and Hyden, Daniel W., 3,918,322.

Hydril Company: *See—*
Le Rouax, Robert K., 3,918,478.

Hydro-Quebec: *See—*
Moreau, Richard, 3,918,172.

Hydro, William R., to United States of America, Army. Substituted piperidinium chlorides. 3,919,243, Cl. 260-293.670.

I. C. Johnson & Son, Inc.: *See—*
Neumiller, Phillip J., 3,918,952.

I-T-E Imperial Corporation: *See—*
Strobel, Albert; and Michetti, Anthony B., 3,919,514.

Iannini, Americo A.: *See—*
Abernethy, Charles N., III; and Iannini, Americo A., 3,918,176.

Ichikawa, Shigemasa, to Aiphone Kabushiki Kaisha. Crosstalk prevention in interphone systems and the like. 3,919,490, Cl. 179-37.000.

Ichino, Motonobu: *See—*
Kikugawa, Kiyomi; Suehiro, Hideo; Ichino, Motonobu; and Nakamura, Tokuro, 3,919,194.

Ichiyanagi, Toshikazu: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 3,918,802.

ICI Australia Limited: *See—*
Bolza, Frederick, 3,919,015.

ICI Australia Limited: *See—*
Fox, Richard; and Hay, David Gilbert, 3,919,013.

ICI United States Inc.: *See—*
Baldino, James P.; and Feltzin, Joseph, 3,919,128.

ICN Pharmaceuticals: *See—*
Meyer, Rich B.; and Shuman, Dennis A., 3,919,192.
Mian, Abdul M.; and Robins, Roland K., 3,919,193.

Ida, Syunya; and Endo, Norio, to Kaneko Ltd. Method for coloring fibrous material composed of phenolic resins. 3,918,901, Cl. 8-172.000.

Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, to Mitsubishi Rayon Co., Ltd.; and Nitto Chemical Industry Co., Ltd. Thermoplastic resin composition having high transparency and high impact strength. 3,919,157, Cl. 260-29.70T.

Idel, Vladimir Viktorovich. Master form device for metal-working machine tools. 3,918,324, Cl. 74-568.0FS.

Iinuma, Kazuhiro: *See—*
Itamura, Einoshin; and Iinuma, Kazuhiro, 3,919,683.

IIT Research Institute: *See—*
Wright, Charles Donald; Gutfreund, Kurt; and Brzuskiewicz, John, 3,919,719.

Ikeda, Tadashi: *See—*
Sato, Akira; Ikeda, Tadashi; Shiba, Keisuke; and Takei, Haruo, 3,918,979.

Ikemi, Tadashi: *See—*
Kato, Masayoshi; Eto, Yoshiyuki; Ikemi, Tadashi; and Matsumoto, Chinami, 3,919,120.

Im, Suk Joong: *See—*
Dubeck, Michael; and Im, Suk Joong, 3,918,962.

Imaizumi, Kenichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal arrangement for a rotary engine. 3,918,858, Cl. 418-142.000.

Imazu, Shinichi: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,919,361.

Imperial Chemical Industries Limited: *See—*
Fox, John Cuthbert; Winterbottom, Martin Richard; and Culpin, Michael Frank, 3,918,399.
Gill, Wendy Rawstron; and Norbury, John, 3,919,033.
Marriott, Richard John, 3,919,314.

Industrie Pirelli S.p.A.: *See—*
Priaroggia, Paolo Gazzana, 3,918,281.

Ingham, John D.: *See—*
Rhein, Robert A.; and Ingham, John D., 3,919,172.

Inkster, John S.; and Burn, Norman. Ventilators. 3,918,447, Cl. 128-145.800.

Inmont Corporation: *See—*
Bussell, George W., 3,919,453.

Inohara, Masanobu, to Onitsuka Co., Ltd. Sport shoe. 3,918,181, Cl. 36-2.50A.

Inoue, Hiroshi, to Riken Piston Ring Industrial Co., Ltd. Wear resistant sintered alloy. 3,918,923, Cl. 29-182.500.

Inouye, Henry; and Liu, Chain T., to United States of America, Energy Research and Development Administration. Iridium-hafnium alloy. 3,918,965, Cl. 75-172.00R.

Institut de Recherches de la Siderurgie Francaise: *See—*
Alberny, Robert; and Leclercq, Alain, 3,918,467.
Donnadieu, Henri, 3,918,299.

Institut Francais du Petrole: *See—*
Cohen, Georges; Gracco, Francis; and Mikitenko, Paul, 3,919,078.
Dawans, Francois; and Durand, Jean-Pierre, 3,919,133.
Parc, Guy; Born, Maurice; and Rojey, Alexandre, 3,919,075.

Institut Francaise du Petrole, des Carburants et Lubrifiants: *See—*
Bourdoncle, Bernard; and Sillion, Bernard, 3,919,187.

Institutul de Cercetari, i Proiectari Automatizari si Proiectari Uzine si Instalatil Pentru Industria Electrotehnica: *See—*
Jonescu, Vasile, 3,919,389.

Instrumentation Specialties Company: *See—*
Allington, Robert W., 3,918,811.

Intel Corporation: *See—*
Chou, Sunlin, 3,919,711.
Roberts, Gary, 3,918,149.

Intellectual Property Development Corporation: *See—*
Saltzman, William H., 3,919,266.

International Business Machines Corporation: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 3,919,701.
Clark, Virgil R.; Goodew, Carroll D.; Kueper, Terrance W.; and Price, Byron H., 3,919,565.
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., 3,919,700.
Craft, James Alexander, 3,918,706.
Criscimagna, Tony N., 3,919,591.
Cullen, Francis M.; Roshon, David D., Jr.; and Snyder, Keith A., 3,919,717.
Gaensslen, Fritz H.; and Krick, Paul J., 3,919,569.
Gindi, Abraham M.; and Lang, Donald J., 3,919,483.
Gooding, David N., 3,919,695.
Kilmer, Charlie C., Jr.; and Laurer, George J., 3,919,447.
Kukla, William J.; and Munzel, Howard E., 3,918,968.
Magdo, Ingrid E.; and Magdo, Steven, 3,918,148.
Pogge, H. Bernhard; and Poponiak, Michael R., 3,919,060.

International Harvester Company: *See—*
Packard, Norman M., 3,918,211.
Zimmerman, Richard F., 3,918,601.

International Nickel Company, Inc., The: *See—*
Llewelyn, David Myers, 3,918,955.
Petersen, Walter Adrian, 3,919,519.

International Shoe Machine Corporation: *See—*
Santilli, Victor E., 3,918,115.
Vornberger, Walter, 3,918,394.

International Standard Electric Corporation: *See—*
Dymoke-Bradshaw, Leslie E. B., 3,919,500.
Manzoni, Angelo, 3,919,494.
Reh, Klaus; and Schulz, Peter, 3,919,599.

International Telephone and Telegraph Corporation: *See—*
Acevedo, Generoso; and Jhatakia, Ashok Chadrakant, 3,919,488.
Hybarger, Kenneth Charles, 3,918,321.
Stolzy, Albert Donald, 3,918,292.

Interstate Products, Inc.: *See—*
Kosch, Paul; and Kosch, Paul James, 3,918,283.

Intertechnique S.A.: *See—*
Reich, Andrew, 3,918,911.

Iozzio, Phyllis. Rain jacket for dogs. 3,918,238, Cl. 54-79.000.

Irako, Koichi: *See—*
Furukawa, Junji; Iseda, Yutaka; Haga, Kazuo; and Irako, Koichi, 3,919,180.

Isaac, Eirlys R.; and Barker, Michael D., to Shell Oil Company. Trihydric alcohol derivatives. 3,919,251, Cl. 260-340.900.

Isaac, Eirlys R.: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 3,919,252.

Isacsson, Sven E., to Brake Roller Company. Conveyor brake roller. 3,918,561, Cl. 193-35.00A.

Isbister, Stephen W., to ITW Limited. Plastics fasteners. 3,918,754, Cl. 292-224.000.

Iseda, Yutaka: *See—*
Furukawa, Junji; Iseda, Yutaka; Haga, Kazuo; and Irako, Koichi, 3,919,180.

Ishida, Choshichi, to Ishida Industry Company Limited. Rotary internal combustion engine. 3,918,415, Cl. 123-8.450.

Ishida, Hiroshi: *See—*
Usami, Hiroshi; Kohari, Katsuo; and Ishida, Hiroshi, 3,919,608.

Ishida Industry Company Limited: *See—*
Ishida, Choshichi, 3,918,415.

Ishiguro, Juichi; Miyasaka, Matsuho; and Kitajima, Nobumitsu, to Ebara Manufacturing Co., Ltd. Method of joining by diffusion welding a hollow part of nonferrous metal onto the inner surface of a hollow part of ferrous metal. 3,918,623, Cl. 228-127.000.

Ishihama, Atsumi: *See—*
Okamoto, Tadao; Komamura, Takeo; and Ishihama, Atsumi, 3,918,445.

Ishikawa, Haruhisa: *See—*
Kishi, Emitsu; Shinohara, Osamu; and Ishikawa, Haruhisa, 3,918,661.

Ishikawa, Michio: *See—*
Okubo, Hideo; and Ishikawa, Michio, 3,918,654.

Ishizaki, Keizo; and Fujimori, Sigeo, to Nippon Steel Corporation. Submerged welding method for high toughness welded metal. 3,919,517, Cl. 219-73.000.

Itamura, Einoshin; and Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave transmitting and receiving apparatus. 3,919,683, Cl. 340-1.00R.

Ito, Hideo: *See—*
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.

ITW Limited: *See—*
Isbister, Stephen W., 3,918,754.

Ivanitskaya, Tamara Mikhailovna: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Iwamatsu, Seiichi, to Hitachi, Ltd. Method of manufacturing MOS type semiconductor devices. 3,919,008, Cl. 148-187.000.

Iwao, Mitsuru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Ignition plug for electric cigarette lighter. 3,919,521, Cl. 219-267.000.

Iwasaki, Shoji: *See—*
Nonaka, Hiroshi; Usugi, Kikuo; Okada, Masataka; and Iwasaki, Shoji, 3,918,716.

Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Suko, Shoichi; Uchida, Kozo; and Tamada, Seiichi, 3,919,601.

Iwasawa, Maozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, to Kansai Paint Company, Ltd. Powder coating compositions. 3,919,352, Cl. 260-856.000.

Iwasawa, Naozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, to Kansai Paint Company, Ltd. Powder coating compositions. 3,919,350, Cl. 260-850.000.

Iwatani, Akitoshi: *See—*
Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, 3,919,361.

Iwatsu Electric Co., Ltd.: *See—*
Samizo, Hiroshi, 3,919,598.

Izumisawa, Masato; and Miyaoka, Senri, to Sony Corporation. Color signal control system for color television receivers. 3,919,712, Cl. 358-27.000.

Jablonsky, Erich; Pfundstein, Wolfgang; and Elser, Dieter, to Zahnradfabrik Friedrichshafen. Motor vehicle steering gear. 3,918,544, Cl. 180-79.20R.

Jache, Otto. Leakproof bonding of storage battery components. 3,919,371, Cl. 264-46.600.

Jacobellis, Alphonse A., to Greer Hydraulics, Inc. Relief and unloading valve. 3,918,470, Cl. 137-115.000.

Jacobsen Manufacturing Company: *See—*
Haffner, Donald G.; Meyer, Dean A.; Ecker, Franklin A.; and Akgulian, Sahag C., 3,918,240.

Jacobson, Peter E.; and Pirman, Robert L., to Sperry Rand Corporation. Dynamically balanced bearing assembly. 3,918,778, Cl. 308-201.000.

Jacoby, Frederick J.: *See—*
Khanna, Ravi; and Jacoby, Frederick J., 3,919,156.

Jaffe, Fred; and Toy, Arthur D. F., to Stauffer Chemical Company. Acylated phenylene diamines. 3,919,269, Cl. 260-404.500.

Jagenberg Werke AG: *See—*
Zodrow, Rudolf, 3,919,040.

Jager, Horst; and Schafer, Paul, to Ciba-Geigy AG. Perfluoroalkyl groups containing polymerisation products. 3,919,183, Cl. 260-86.10R.

James, Opal R., to Hudson Engineering Corporation. Atmospheric heat exchangers. 3,918,518, Cl. 165-122.000.

Jameson, Chester E., to Acme-Cleveland Corporation. Composite stock tube. 3,918,696, Cl. 269-287.000.

Jangestrand, Gert Harald Leopold: *See—*
Brown, Michael Alwyn; and Jangestrand, Gert Harald Leopold, 3,919,364.

Janin, Raymond; and Krumenacker, Leon, to Rhone-Poulenc S.A. Process for the preparation of anthraquinone. 3,919,263, Cl. 260-385.000.

Jaray, Francis Ferdinand, to Glass Fibres and Equipment Limited. Glass-spinning apparatus. 3,918,946, Cl. 65-1.000.

Jasinski, Stanley C., to Eaton Yale Ltd. Shear blade. 3,918,476, Cl. 144-34.00E.

Javet, Philippe: *See—*
Plattner, Eric; Comninellis, Christos; and Javet, Philippe, 3,919,057.

Jayroe, Charles H.: *See—*
Ramsey, David W.; and Jayroe, Charles H., 3,919,169.

Jean-Grandremy, Alain: *See—*
Carraz, Gilbert; Pigerol, Charles; Jean-Grandremy, Alain; and Eymard, Pierre Luc, 3,919,229.

Jeffreys, Dennis Clifford: *See—*
Fougere, Guy Lloyd; Greene, Walter John; and Jeffreys, Dennis Clifford, 3,918,565.

Jesiolowski, David: *See—*
Dybala, Ambrose B.; Jesiolowski, David; Nowicki, Casimir W.; and Shapler, Thomas A., 3,918,874.

Jhatakia, Ashok Chadrakant: *See—*
Acevedo, Generoso; and Jhatakia, Ashok Chadrakant, 3,919,488.

Jimbo, Tadashi: *See—*
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.

JKC Products, Inc.: *See—*
Peebles, John G., Jr., 3,918,466.

Jobst, Wilhelm, to Aktiengesellschaft "Weser". Drive system. 3,918,387, Cl. 115-.50B.

Jochum, Peter; and Benz, Gottfried, to Hilti Aktiengesellschaft. Explosive charge-driven anchoring element setting gun. 3,918,621, Cl. 227-10.000.

Joh. A. Benckiser GmbH: *See—*
Krueger, Friedrich; and Michel, Walter, 3,919,297.

John Wyeth & Brother Limited: *See—*
Cavalla, John Frederick; and Archibald, John Leheup, 3,919,242.

Johns-Manville Corporation: *See—*
Davis, Lyman Clifford, 3,918,994.

Johnson, Carl E.; and Baker, Alan D., to Atlantic Richfield Company. Purification of recirculated stream for isophthalic acid production. 3,919,306, Cl. 260-524.00R.

Johnson, Douglas M.: *See—*
Saville, Russell H.; and Johnson, Douglas M., 3,918,756.

Johnson, Glenn E.; and Lufkin, Martin H., to Textron, Inc. Main rotor elastomeric bearing seal. 3,918,836, Cl. 416-136.000.

Johnson, Howard L.: *See—*
Junck, John A.; and Johnson, Howard L., 3,918,847.

Johnson & Johnson: *See—*
Dean, William Bruce, 3,918,134.

Johnson, Paul H., to Phillips Petroleum Company. Carbon black reactor. 3,918,914, Cl. 23-259.500.

Johnson Service Company: *See—*
Matthews, Russell Byron, 3,918,881.

Jolly, Jean: *See—*
Warnant, Julien; and Jolly, Jean, 3,919,198.
Warnant, Julien; and Jolly, Jean, 3,919,267.

Jomos- Sprinkler-Material AG: *See—*
Mohler, Hans, 3,918,645.

Jones, Robert L., to University Court of the University of Edinburgh, The. 19-Hydroxy-PGC compounds. 3,919,287, Cl. 260-468.00D.

Jones, Thomas Ivor: *See—*
Richardson, Norman; Jones, Thomas Ivor; and Miles, Peter, 3,919,258.

Jones, Walter C., to Rubber Dynamics Corporation. Method of making inflatable life raft. 3,919,027, Cl. 156-145.000.

Jones, Walter C., to Rubber Dynamics Corporation. Elastic storage tank and method for making the same. 3,919,030, Cl. 156-211.000.

Jonescu, Vasile, to Institutul de Cercetari, i Proiectari Automatizari si Proiectari Uzine si Instalatil Pentru Industria Electrotehnica. Method of purifying air containing mercury vapor. 3,919,389, Cl. 423-210.000.

Joyner, Frederick B.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 3,919,176.

Judd, Richard K., to General Motors Corporation. Bushing for carburetor plate linkage. 3,919,366, Cl. 261-50.00A.

Jumer, John F. Polishing large cylindrical vessels or tanks with closed ends. 3,919,061, Cl. 204-129.600.

Junck, John A.; and Johnson, Howard L., to Caterpillar Tractor Company. Accumulator charging circuit for high pressure hydraulic system. 3,918,847, Cl. 417-288.000.

Jung, Gerhard: *See—*
Klag, Gunther; Wunderlich, Hermann; Jung, Gerhard; and Aumuller, Rolf, 3,919,334.

Jungheinrich Unternehmensuerwaltung KG: *See—*
vom Berg, Hugo; and Schalmath, Heinz, 3,918,118.

Jurisch, Louis A., to Commerical Solvents Corporation. Binders from the condensations of an oxazoline with an ethylenically unsaturated monomer and formaldehyde. 3,919,135, Cl. 260-73.00L.

Jury, Kenneth James; and Mottram, Brian John, to Ryton Machine Tools (Coventry) Limited. Method of grinding a surface of a workpiece and a tool for carrying out the method. 3,918,220, Cl. 51-328.000.

Kabo Kogyo Co. Ltd.: *See—*
Hattori, Yasuzo; and Niizuma, Jiro, 3,918,526.

Kabushiki Kaisha Daini Seikosha: *See—*
Katagiri, Yoshio; and Miyata, Yoshio, 3,919,105.

Kabushiki Kaisha Hasegawa Haguruma: *See—*
Kida, Kihachi; Akane, Takahiro; Hosoe, Satosi; and Sugita, Tadashi, 3,918,326.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Minami, Teruo, 3,918,488.
Nagatomo, Masatugu, 3,918,556.

Kabushiki Kaisha Seikosha: *See—*
Katagiri, Yoshio; and Miyata, Yoshio, 3,919,105.
Nemoto, Koji, 3,919,606.

Kabushiki Kaisha Suwa Seikosha: *See—*
Shimodaira, Tadayoshi, 3,918,568.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Iwao, Mitsuru, 3,919,521.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Katoh, Takashi; and Yamaoka, Yoshiaki, 3,918,128.
Suzuki, Yoshihisa, 3,918,248.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.

Kabushiki Kaisha Yoshikawa Seisakusho: *See—*
Yoshikawa, Kunihiko, 3,918,120.

Kabushikikaisha Tokyo Keiki: *See*—
Kitada, Toyohiko, 3,918,296.

Kaiser, Anton; Keller, Helmut; and Kugelmann, Adolf, to Robert Bosch G.m.b.H. Electric circuit arrangement and method of making the same. 3,919,602, Cl. 317-101.00C.

Kaiser, Bernhard; and Wokock, Ortwin, to Kienzle Apparate GmbH. Mechanism for sealing coin insertion slots in time vending machines or the like. 3,918,566, Cl. 194-102.000.

Kaiser, Bernhard: *See*—
Wokock, Ortwin; and Kaiser, Bernhard, 3,918,562.

Kaiser Glass Fiber Corporation: *See*—
Lewis, Albert; and Krueger, Ronald G., 3,919,028.

Kalfaian, Meguer V. Phonetic sound recognizer. 3,919,481, Cl. 179-1.0SA.

Kalman, Peter J.: *See*—
Oglivie, Frank R.; and Kalman, Peter J., 3,918,145.

Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. Dye composition for keratinic fibers containing an oxidation base and a meta-aminophenol coupler. 3,918,896, Cl. 8-10.200.

Kameyama, Tadao; and Watanabe, Akinori, to Hitachi, Ltd. Elevator control system. 3,918,552, Cl. 187-29.00R.

Kamezawa, Yasutoki: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.

Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Resistors for ignition plugs. 3,919,123, Cl. 252-518.000.

Kaminstein, Bernard. Racket stringing machine. 3,918,713, Cl. 273-73.00A.

Kanao, Seizo: *See*—
Toyoshima, Shigeshi; Kanao, Seizo; Toyoda, Takeshi; and Suyama, Tadashi, 3,919,291.

Kanehira, Katsuyuki: *See*—
Hayamizu, Yoshisada; and Kanehira, Katsuyuki, 3,918,438.

Kaneko Ltd.: *See*—
Ida, Syunya; and Endo, Norio, 3,918,901.

Kansai Paint Company, Ltd.: *See*—
Iwasawa, Maozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,352.
Iwasawa, Naozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,350.
Maruyama, Tsutomu; and Murata, Koichiro, 3,919,063.

Kansas State University Research Foundation, The: *See*—
Al Nema, Mudhafar A.; and Koepsel, Wellington W., 3,919,622.

Kansas University Research Foundation, The: *See*—
Tsen, Cho C.; and Hoover, William J., 3,919,434.

Kao Soap Co., Ltd.: *See*—
Asai, Schumkichiro; and Kawakatsu, Yasuyuki, 3,919,142.

Kao, Wenling: *See*—
Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., 3,919,302.

Karcher, Thomas D.; and Kourah, Aly A., to Hansen Manufacturing Company, The. Minimum spill quick disconnect coupling. 3,918,492, Cl. 137-614.040.

Kargilis, Alexander, to McCord Corporation. Fuel evaporator plate. 3,918,422, Cl. 123-122.0AC.

Karl Neumayer GmbH, Firma: *See*—
Ascher, Dieter, 3,919,069.

Karnaev, Nikolai Alexandrovich: *See*—
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Kase, Makoto: *See*—
Suzuki, Kenzo; Mizobuchi, Toshio; and Kase, Makoto, 3,918,957.

Kasperkovitz, Wolfdietrich Georg, to U.S. Philips Corporation. Sensor provided with a pick-up panel. 3,919,469, Cl. 178-7.100.

Katagiri, Yoshio; and Miyata, Yoshio, to Kabushiki Kaisha Daini Seikosha; and Kabushiki Kaisha Seikosha. Nematic liquid crystal compositions exhibiting positive dielectric anisotropy. 3,919,105, Cl. 252-299.000.

Kato, Masayoshi; Eto, Yoshiyuki; Ikemi, Tadashi; and Matsumoto, Chinami, to Nissan Motor Company Limited. Catalyst composition and a method for production thereof. 3,919,120, Cl. 252-466.00B.

Katoh, Takashi; and Yamaoka, Yoshiaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for setting the intervening space between a bottom roller and a top roller of a roller assembly. 3,918,128, Cl. 19-260.000.

Katsimbas, Themistoklis, to Hoechst Aktiengesellschaft. Heat-curable pulverulent coating agent consisting of a mixture of copolymers containing anhydrides and curing accelerators. 3,919,346, Cl. 260-836.000.

Katsimbas, Themistoklis, to Hoechst Aktiengesellschaft. Heat-curable pulverulent coating agent consisting of a mixture of copolymers containing glycidyl groups, dicarboxylic acid anhydrides and curing accelerators. 3,919,347, Cl. 260-836.000.

Katsumata, Masayoshi, to Kayabakogyo kabushikikaisha. Harness cord selecting and driving device for jacquard machines. 3,918,500, Cl. 139-59.000.

Katsushima, Atsuo; Imazu, Shinichi; Fukui, Shoshin; Iwatani, Akitoshi; and Akazawa, Tadashi, to Daikin Kogyo Kabushiki Kaisha. Polyfluoroalkyl hydroxypropyl phosphates. 3,919,361, Cl. 260-953.000.

Katz, Jerome. Hydrogen peroxide bleaching solution and method. 3,918,898, Cl. 8-111.000.

Kauders, Herbert J.; and Vincent, Thomas C., to General Electric Company. Process for preparing substituted halophosphate phosphors. 3,919,109, Cl. 252-301.60P.

Kaufeldt, Roland T. A., to Monark-Crescent AB. Article handling and transferring machine. 3,918,593, Cl. 214-1.0BH.

Kawagoe, Takahiro: *See*—
Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, 3,919,184.

Kawakami, Hirotake: *See*—
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,722.
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,723.

Kawakami, Syoichi: *See*—
Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, 3,919,157.

Kawakatsu, Yasuyuki: *See*—
Asai, Schumkichiro; and Kawakatsu, Yasuyuki, 3,919,142.

Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, to Hitachi, Ltd. Method of manufacturing a welded type francis runner. 3,918,627, Cl. 228-178.000.

Kayabakogyo kabushikikaisha: *See*—
Katsumata, Masayoshi, 3,918,500.

Kazyaka, Thomas G.: *See*—
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., 3,919,700.

Keating, Francis J., to Keating, Francis J. Distance measuring devices. 3,918,163, Cl. 33-142.000.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics. 3,919,138, Cl. 260-17.00R.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics. 3,919,139, Cl. 260-17.00R.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics, case 2. 3,919,357, Cl. 260-895.000.

Keene, George W. Rubbing and liquid applying apparatus. 3,918,408, Cl. 119-157.000.

Kehr, Sharon A.: *See*—
Hoff, Seymour; Kehr, Sharon A.; and Pharriss, Bruce B., 3,918,444.

Keio Giken Kogyo Kabushikikaisha: *See*—
Mieda, Fumio, 3,918,342.

Kelco Company: *See*—
Empey, Richard A.; and Pettitt, David J., 3,919,189.

Keller, Helmut: *See*—
Kaiser, Anton; Keller, Helmut; and Kugelmann, Adolf, 3,919,602.

Keller, Russell D. Fuel tank filler cap. 3,918,606, Cl. 220-208.000.

Keller, Wolfgang: *See*—
Schabacher, Werner; Rohe, Hermann; Keller, Wolfgang; and Spreckelmeyer, Bernhard, 3,919,399.

Kellogg Company: *See*—
Richardson, Larry A., 3,918,584.

Kellogg, Walter J., to Westinghouse Electric Corporation. Detachably mounted cam operator for multiple reciprocating contact switch assembly. 3,919,506, Cl. 200-16.00A.

Kemel, Noel, to N. V. Bekaert S.A. Apparatus for winding wire onto a bobbin. 3,918,650, Cl. 242-25.00R.

Kendall Company, The: *See*—
Patel, Bhupendra C., 3,918,450.
Patel, Bhupendra C., 3,918,456.
Vida, Julius A.; and Samour, Carlos M., 3,919,427.

Kennametal Inc.: *See*—
Friedline, Ernest J., 3,918,826.
Nemeth, Bela J.; and Burghardt, Alden M., 3,918,138.

Kennedy, James D.: *See*—
Lindner, Henry; and Kennedy, James D., 3,918,795.

Kennedy, John Frederick: *See*—
Barker, Sidney Alan; and Kennedy, John Frederick, 3,919,190.

Kennedy, Paul G.: *See*—
Spiessbach, Andrew J.; Parrish, William F.; and Kennedy, Paul G., 3,919,471.

Kent Industrial Corporation: *See*—
Liu, Hsing-Ching, 3,918,819.

Kerner, Karl, to Robert Bosch G.m.b.H. Vaporizer apparatus for vapor deposition equipment. 3,919,525, Cl. 219-271.000.

Kersten, Herbert H., to Tekko Corporation. Convertible compartment container. 3,918,604, Cl. 220-22.000.

Kessler, Gerald. Frost resistant window sash. 3,918,231, Cl. 52-628.000.

Khanna, Ravi; and Jacoby, Frederick J., to Eastman Kodak Company. Anionic emulsion polymerizations of vinyl and acrylic monomers. 3,919,156, Cl. 260-29.6TA.

Kida, Kazuo; and Kubota, Naokazu, to Dengyosha Machine Works, Ltd. Pump impeller assembly. 3,918,841, Cl. 416-183.000.

Kida, Kihachi; Akane, Takahiro; Hosoe, Satosi; and Sugita, Tadashi, to Kabushiki Kaisha Hasegawa Haguruma. Balancer with flexible gear to move weight. 3,918,326, Cl. 74-573.000.

Kiel, Jessie H., administratrix: *See—*
Kiel, Robert H., deceased; Kiel, Jessie H., administratrix; and Grinonneau, William C., 3,919,150.

Kiel, Robert H., deceased; by Kiel, Jessie H., administratrix; and Grinonneau, William C., to Owens-Illinois, Inc. Hydroxy functional acrylic ink. 3,919,150, Cl. 260-28.50R.

Kienzle Apparate GmbH: *See—*
Kaiser, Bernhard; and Wokock, Ortwin, 3,918,566.
Muller, Helmuth, 3,918,634.
Wokock, Ortwin; and Kaiser, Bernhard, 3,918,562.

Kierstead, Richard Wightman: *See—*
Guthrie, Robert William; and Kierstead, Richard Wightman, 3,919,254.

Kieslich, Klaus: *See—*
Vidic, Hans-Jorg; and Kieslich, Klaus, 3,919,047.

Kikugawa, Kiyomi; Suehiro, Hideo; Ichino, Motonobu; and Nakamura, Tokuro, to Kohjin Co., Ltd. S-substituted 2-thioadenosine-5'-monophosphates and process for producing the same. 3,919,194, Cl. 260-211.50R.

Kilmer, Charlie C., Jr.; and Laurer, George J., to International Business Machines Corporation. Spectral differential coded card. 3,919,447, Cl. 428-138.000.

Kim, Charles W., to Hercules Incorporated. Methods of making fabrics from synthetic tapes. 3,918,135, Cl. 28-72.0CS.

Kim, Dae Sik. Paint applicator. 3,918,820, Cl. 401-152.000.

Kimura, Katsuhiko: *See—*
Soya, Isao; Kimura, Katsuhiko; Nobuto, Tooru; and Nagai, Yawara, 3,918,910.

Kimura, Robert B.: *See—*
Bobel, Robert J., II; Kimura, Robert B.; and Pollex, Robert C., 3,919,531.

King, Donald P.: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.

King, Robert P.: *See—*
Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., 3,919,696.

King, Wendell L.; and Stokes, Kenneth B., to Medtronic, Inc. Implantable electrical medical device with battery gas venting means. 3,918,460, Cl. 128-419.00P.

Kingma, Geoffrey W., to Texas Instruments Incorporated. Time-delay switch. 3,919,679, Cl. 337-107.000.

Kinzenbaw, Jon E., to DMI Inc. Plow system with plurality of plow units and means for adjusting spacing between units in a continuous manner. 3,918,528, Cl. 172-218.000.

Kinzler, Georg: *See—*
Claussen, Uwe, 3,918,317.

Kirby, Peter: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 3,919,252.

Kircher, Robert Edward: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Kircher, Robert Edward, 3,918,198.

Kirkland, Arthur C. Vehicle suspension. 3,918,739, Cl. 280-124.00B.

Kirnos, Yakov Yakovlevich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Kirschnek, Helmut; and Gorlich, Hans, to Bayer Aktiengesellschaft. Polyamine derivatives. 3,919,270, Cl. 260-404.500.

Kishi, Emitsu; Shinohara, Osamu; and Ishikawa, Haruhisa, to Shinhama Pump Mfg. Co., Ltd. Paper roll holder. 3,918,661, Cl. 242-55.200.

Kishida, Kazuo: *See—*
Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, 3,919,157.

Kitada, Toyohiko, to Kabushikikaisha Tokyo Keiki. Pulse reflection type ultrasonic thickness meter. 3,918,296, Cl. 73-67.700.

Kitajima, Nobumitsu: *See—*
Ishiguro, Juichi; Miyasaka, Matsuho; and Kitajima, Nobumitsu, 3,918,623.

Kitaoka, Takashi; Shirane, Yasuhiro; and Yamada, Junzo, to Sumitomo Metal Industries Limited; and Mitsubishi Denki Kabushiki Kaisha. Roll stabilized pneumatically sprung railway car. 3,918,369, Cl. 105-164.000.

Kitayama, Teruki; Takahara, Hiroaki; and Ogawa, Hiroshi, to Hoya Glass Works, Ltd. Apparatus for shearing flowing molten glass. 3,918,951, Cl. 65-334.000.

Kitchin, Oscar G., to General Motors Corporation. Sheet metal ball bearing retainer and method of making same. 3,918,777, Cl. 308-201.000.

Kittredge, Edward D. Process printing. 3,918,567, Cl. 197-1.00R.

Kiuchi, Akira; and Tanaka, Yuji, to Tokyo Tanabe Co., Ltd. Process for preparing β-galactosidase. 3,919,049, Cl. 195-66.00R.

Kiyonaga, Kingo; and Hada, Haruki, to Hitachi Metals, Ltd. Shank or back material for high speed steel tools. 3,918,928, Cl. 29-196.100.

Klag, Gunther; Wunderlich, Hermann; Jung, Gerhard; and Aumuller, Rolf, to Bayer Aktiengesellschaft. Process for preparing pyrocatechol. 3,919,334, Cl. 260-629.000.

Klatt, Alfred, to WABCO Westinghouse G.m.b.H. Individual wheel anti-skid brake control system having means to prevent excessive brake pressure differences. 3,918,766, Cl. 303-21.00P.

Klautschek, Herwig; and Kollensperger, Dieter, to Siemens Aktiengesellschaft. Method and circuit for reducing the torque ripple of a rotating-field machine. 3,919,609, Cl. 318-227.000.

Klein, Gerald I., to Westinghouse Electric Corporation. Microwave phase shifter. 3,919,670, Cl. 333-31.00A.

Klein, Schanzlin * Becker Aktiengesellschaft: *See—*
Honold, Ernst; and Rupp, Michael, 3,918,272.

Kleindienst & Co., Firma: *See—*
Donner, Sigmar, 3,918,700.

Kleisa, Kurt: *See—*
Schmalfeld, Paul; Hahn, Helmut; Lehmann, Joachim; and Kleisa, Kurt, 3,918,929.

Klemmer, Herbert: *See—*
Hofmann, Rudolf; and Klemmer, Herbert, 3,918,737.

Kline, Joseph M. Container for animal feed. 3,918,502, Cl. 150-1.000.

Kline, Jules M.: *See—*
Lee, Yuan C.; Kline, Jules M.; and Stary, Marvin L., 3,918,932.

Kline, Richard L., to American Air Filter Company, Inc. Electrode support apparatus for electrical precipitators. 3,918,938, Cl. 55-148.000.

Klockner-Werke AG: *See—*
Langhammer, Hans Jurgen, 3,919,454.

Klose, Karl W., to Cooper Tire and Rubber Company. Vulcanizing press with rotary locking mechanism. 3,918,861, Cl. 425-47.000.

Knifton, John F., to Texaco Inc. Process for preparing linear fatty acids. 3,919,272, Cl. 260-410.90R.

Knoll, Heinz W.: *See—*
Andres, Rudolf; and Knoll, Heinz W., 3,918,545.

Knott, Ken E.; and Dodd, Alan J., to Dodd, Alan J. Railing system. 3,918,686, Cl. 256-59.000.

Knudtson, John P.: *See—*
Krupp, Myron J.; Colburn, Fred R.; and Knudtson, John P., 3,919,152.

Kobayashi, Eiichi: *See—*
Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, 3,919,184.

Koch, Gilbert E.; and Hubler, Lawrence C., to Xerox Corporation. Processing control device for printing machines. 3,918,705, Cl. 271-243.000.

Koch, Robert B.; Nelson, Leroy D.; and Rork, Gerald D., to Honeywell Inc. Biological analyzer and method. 3,919,051, Cl. 195-103.50R.

Koenig, Paul W., to General Electric Company. Metallic plate-semiconductor assembly and method for the manufacture thereof. 3,919,709, Cl. 357-65.000.

Koepsel, Wellington W.: *See—*
Al Nema, Mudhafar A.; and Koepsel, Wellington W., 3,919,622.

Kofink, Siegfried, to Eberspacher, J. Heater assembly for motor vehicle with water-cooled combustion engine. 3,918,637, Cl. 237-12.30C.

Kogyo Gijutsuin: *See—*
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,919,007.

Kohari, Katsuo: *See—*
Usami, Hiroshi; Kohari, Katsuo; and Ishida, Hiroshi, 3,919,608.

Kohjin Co., Ltd.: *See—*
Kikugawa, Kiyomi; Suehiro, Hideo; Ichino, Motonobu; and Nakamura, Tokuro, 3,919,194.

Kohn, Harold B.; and Friedman, George, to Lummus Company, The. Catalystic reactor. 3,918,918, Cl. 23-288.00K.

Kojima, Tadashi: *See—*
Kurokawa, Akira; and Kojima, Tadashi, 3,919,641.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Oshima, Shintaro; Watanabe, Teruji; and Fukui, Takasuke, 3,919,630.

Kollensperger, Dieter: *See—*
Klautschek, Herwig; and Kollensperger, Dieter, 3,919,609.

Kolodziej, Kenneth W. Smoking device. 3,918,464, Cl. 131-173.000.

Komamura, Takeo: *See—*
Okamoto, Tadao; Komamura, Takeo; and Ishihama, Atsumi, 3,918,445.

Komendowski, Henry, to Automatic Liquid Packaging, Inc. Method for blow molding a container having an auxiliary component formed as an integral part of it. 3,919,374, Cl. 264-90.000.

Komine, Yoshio: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 3,918,802.

Komline-Sanderson Engineering Corporation: *See—*
Schlegel, William L.; Grabarczyk, Joseph E.; and Krihak, Robert J., 3,918,821.

Kondelikova, Jaroslava: *See—*
Kralicek, Jaroslav; Kubanek, Vladimir; and Kondelikova, Jaroslava, 3,919,175.

Kondo, Keiichi: *See—*
Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, 3,919,363.

Kondoh, Mitsuru, to Ricoh Co., Ltd. Facsimile transmission system. 3,919,464, Cl. 178-6.000.

Konstant, Anthony N. Snap-fastener setting tool. 3,918,140, Cl. 29-271.000.

Kontz, Robert F.; and Morrette, Richard A., to Owens-Illinois, Inc. Parison engaging, severing and stripping method. 3,919,375, Cl. 264-99.000.

Kopfer, Rudolph J. Surgeon hand and arm scrubbing apparatus. 3,918,987, Cl. 134-95.000.

Koppers Company, Inc.: *See—*
Greco, Nicholas P., 3,919,264.
Moult, Roy H.; and Colligan, John J., 3,919,151.

Korinek, Robin: *See—*
Drower, Herbert M.; and Korinek, Robin, 3,918,188.

Kormendi, Kalman, to ELBATAINER Kunststoff- und Verpackungs-Gesellschaft mbH & Co. Method of making a liquid container from thermoplastic synthetic material. 3,919,373, Cl. 264-89.000.

Korodi, Miklos B.; and Dreyer, Frederic C. Soilage-indicating diaper. 3,918,454, Cl. 128-287.000.

Korzec, Walter Anthony, to Warren Pumps, Inc. Low pressure-pulse kinetic pump. 3,918,829, Cl. 415-119.000.

Kosch, Paul; and Kosch, Paul James, to Interstate Products, Inc. Tubular articles and method of making same. 3,918,283, Cl. 72-52.000.

Kosch, Paul James: *See—*
Kosch, Paul; and Kosch, Paul James, 3,918,283.

Kostelnick, Joseph John, to Bell Telephone Laboratories, Incorporated. Nonreciprocal absorption filter. 3,919,673, Cl. 333-24.200.

Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich. Phosphatic catalyst for the dehydrogenation of olefins and alkylated aromatic hydrocarbons and method of preparing same. 3,919,116, Cl. 252-437.000.

Kotlyarsky, Vladimir Mortkovich: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.

Kouchi, Toshihiro: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.

Kourah, Aly A.: *See—*
Karcher, Thomas D.; and Kourah, Aly A., 3,918,492.

Kowalski, Julian: *See—*
Aldred, Edward John; and Kowalski, Julian, 3,918,239.

Kraft, Winfried, to Ernst Leitz G.m.b.H. Fluorescence illuminator for incident light microscope. 3,918,793, Cl. 350-91.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Schroder, Heinz-Jurgen, 3,918,409.

Kralicek, Jaroslav; Kubanek, Vladimir; and Kondelikova, Jaroslava, to Vysoka skola chemicko-technologicka. Method of anionic polymerization and copolymerization of lactam of ω-aminocarboxylic acids. 3,919,175, Cl. 260-78.00L.

Kramer, Jack M. Flexible seal ring. 3,918,726, Cl. 277-227.000.

Kramer, Willi; and Fietz, Peter, to Daimler-Benz Aktiengesellschaft. Bus with water-cooled rear engine. 3,918,547, Cl. 180-54.00A.

Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, to Henkel & Cie G.m.b.H. Process for obtaining cholesterol. 3,919,045, Cl. 195-3.000.

Kraus, Werner. Device for promoting formation of bone material. 3,918,440, Cl. 128-82.100.

Krause Plow Corporation, Inc.: *See—*
Frager, Glenn E.; and Penninger, Bill J., 3,918,529.

Kraush, Friedrich: *See—*
Fischer, Wilhelm; Kraush, Friedrich; Riesner, Walter; and Sonnenmoser, Hubert, 3,918,356.

Krautmann, Edmund J. Measuring device having remote indicating means. 3,918,164, Cl. 33-143.00C.

Kreeft, John: *See—*
Marino, Thomas; Kreeft, John; and Stanislaw, Peter, 3,918,362.

Krenzer, John: *See—*
Sommer, Harold Z.; and Krenzer, John, 3,919,289.

Krick, Paul J.: *See—*
Gaensslen, Fritz H.; and Krick, Paul J., 3,919,569.

Kriebel, Manfred; and Hochgesand, Gerhard, to Metallgesellschaft Aktiengesellschaft. Process for purifying gases. 3,918,934, Cl. 55-48.000.

Krieger, Gregory A., to Allis-Chalmers Corporation. Vehicle cab with dissimilar sound absorbing material. 3,918,541, Cl. 180-69.00R.

Krihak, Robert J.: *See—*
Schlegel, William L.; Grabarczyk, Joseph E.; and Krihak, Robert J., 3,918,821.

Kristinsson, Haukur; and Rufenacht, Kurt, to Ciba-Geigy Corporation. 3H-oxazolo-[4,5-6]-pyridine-2-one ester of 3-(-o-) (-5-)-o-lower alkyl aminophosphates and thiophosphates. 3,919,244, Cl. 260-294.80C.

Krohn, Ivar T.; Page, Geoffrey A.; and Tulagin, Vesvolod, to Xerox Corporation. Contact reflex manifold imaging process. 3,918,967, Cl. 96-1.00M.

Krol, John E.: *See—*
Henderson, Albert J.; and Krol, John E., 3,919,338.

Kronies, Reinhard K.; and Coupland, John R., to Burroughs Corporation. Fast inhibit gate with applications. 3,919,692, Cl. 340-172.500.

Krueger, Friedrich; and Michel, Walter, to Joh. A. Benckiser GmbH. N-(1,1-di-phosphono ethyl) acetamidine, process of making it, and method of using it for preventing scale formation. 3,919,297, Cl. 260-502.500.

Krueger, Ronald G.: *See—*
Lewis, Albert; and Krueger, Ronald G., 3,919,028.

Krumenacker, Leon: *See—*
Janin, Raymond; and Krumenacker, Leon, 3,919,263.

Krupp, Myron J.; Colburn, Fred R.; and Knudtson, John P., to PPG Industries, Inc. Use of barium metaborate in electrodepositable compositions. 3,919,152, Cl. 260-29.4UA.

Kubanek, Vladimir: *See—*
Kralicek, Jaroslav; Kubanek, Vladimir; and Kondelikova, Jaroslava, 3,919,175.

Kubota, Naokazu: *See—*
Kida, Kazuo; and Kubota, Naokazu, 3,918,841.

Kubota, Takashi: *See—*
Yumde, Yasufumi; Narita, Sho; Murai, Mikio; and Kubota, Takashi, 3,919,716.

Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, to Bayer Aktiengesellschaft. Substituted benzyl-thiolcarbamic acid esters as herbicides. 3,918,953, Cl. 71-94.000.

Kueper, Terrance W.: *See—*
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.
Clark, Virgil R.; Goodew, Carroll D.; Kueper, Terrance W.; and Price, Byron H., 3,919,565.

Kugelmann, Adolf: *See—*
Kaiser, Anton; Keller, Helmut; and Kugelmann, Adolf, 3,919,602.

Kuhfus, Gerd, to Northern Electric Company Limited. Die cast frame. 3,919,496, Cl. 179-100.00R.

Kuhfus, Gerd, to Northern Electric Company Limited. Telephone housing with cord grommet and seal. 3,919,497, Cl. 179-100.00C.

Kuhling, Dieter; and Bloching, Helmut, to Henkel & Cie G.m.b.H. Composition and method for activating oxygen utilizing N-acylated tetraaza-bicyclo-nonandiones. 3,919,102, Cl. 252-99.000.

Kukla, William J.; and Munzel, Howard E., to International Business Machines Corporation. Electrophotographic process utilizing carrier particles coated with a fluoropolymer in development. 3,918,968, Cl. 96-1.50D.

Kukolja, Stjepan: *See—*
Lammert, Steven R.; and Kukolja, Stjepan, 3,919,209.

Kullman, Russel M.; and Reinhardt, Robert M., to United States of America, Agriculture. Dehydration process to impart wrinkle resistance to cellulose-containing fibrous materials. 3,918,903, Cl. 8-186.000.

Kumm, Emerson L. Flow control for compressors and pumps. 3,918,828, Cl. 415-61.000.

Kummer, Richard Edward: *See—*
Berglund, Richard Newman; Chaudhary, Ved Prakash; and Kummer, Richard Edward, 3,919,495.

Kuneman, David W. Window arrangement. 3,918,512, Cl. 160-90.000.

Kunsch, Hans-Jurgen: *See—*
Harms, Horst; and Kunsch, Hans-Jurgen, 3,918,653.

Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., to Merck & Co., Inc. Prostaglandin E_1 intermediate, 2a-carboxy-3a-(1-hydroxyethyl)-5-oxocyclopentaneheptanoic acid,γ-lactone, lower alkyl, and aralkyl esters, and processes of their preparation. 3,919,253, Cl. 260-343.300.

Kuraray Plastics Company, Limited: *See—*
Mizutani, Tadashi; and Ono, Soshiro, 3,919,026.

Kurihara, Toshimasa, to Nippon Rutsubo Kabushiki Kaisha. Method and device for fixing an insert to a mold stool. 3,918,624, Cl. 228-112.000.

Kurokawa, Akira; and Kojima, Tadashi, to Tokyo Shibaura Electric Co., Ltd. Data transmission utilizing modulation of alternate carrier cycles. 3,919,641, Cl. 325-38.00R.

Kurtz, Bruce E., to Allied Chemical Corporation. Method of preparing vinyl chloride from liquid ethylene dichloride. 3,919,336, Cl. 260-656.00R.

Kurz, Arthur W., Jr.; and Wilson, Harold R., to Donnelly Mirrors, Inc. Mirror case. 3,918,799, Cl. 350-288.000.

Kuschke, Renate: *See—*
Fenner, Erich; and Kuschke, Renate, 3,919,099.

Kuznetsov, Evgeny Vasilievich: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.

KVB, Inc.: *See—*
Guth, Eugene Daniel; Helgeson, Norman L.; Arledge, Kenneth W.; and Brienza, Anthony R., 3,919,402.

Kwantes, Arien; and Stouthamer, Bernhard, to Shell Oil Company. Process for the purification of 2,2-bis-(4-hydroxyphenyl)propane. 3,919,330, Cl. 260-619.00R.

Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Halo-substituted-5H-dibenzo[a,d]cyclohepten-5-ones. 3,919,321, Cl. 260-590.000.

L. & C. Steinmuller GmbH: *See—*
Schuster, Ernst, 3,918,372.

L. R. Nelson Corporation: *See—*
Malcolm, William R., 3,918,643.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powdered coating composition containing polyanhydride, epoxy and anhydride functional copolymer and flow control agent. 3,919,345, Cl. 260-830.00R.

Labana, Santokh S.: *See—*
Chang, Yun-Feng; Cheung, Mo-Fung; and Labana, Santokh S., 3,919,154.

Labaz: *See—*
Carraz, Gilbert; Pigerol, Charles; Jean-Grandremy, Alain; and Eymard, Pierre Luc, 3,919,229.

Labelle, Bernard O. Carburetor. 3,919,365, Cl. 261-41.00C.

LaBorde, Joseph N., to Ethyl Corporation. Liner for covering intersecting surfaces. 3,918,228, Cl. 52-288.000.

Lacotte, Jean-Pierre: *See—*
Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, 3,919,698.

Ladish Co.: *See—*
Ulichny, Robert M., 3,918,290.

Lafferty, John J.: *See—*
Hill, Harlan F.; and Lafferty, John J., 3,919,230.

LaFreniere, Lawrence J.: *See—*
Forbes, Hampton E., Jr.; and LaFreniere, Lawrence J., 3,918,629.

Lagrange, Jean; and Letournel, Emile. Total knee-joint prosthesis. 3,918,101, Cl. 3-1.911.

Lahey Clinic Foundation, Inc.: *See—*
Curby, William A., 3,919,050.

Laitio, Kari A. Cigarette piercing device. 3,918,462, Cl. 131-170.00R.

Lakshmanan, Pallavoor R., to Gulf Research & Development Company. Adhesive composition. 3,919,160, Cl. 260-32.80A.

Lamb, Thomas H., to Bethlehem Steel Corporation. Fluid sampling device. 3,918,484, Cl. 137-553.000.

Lambert, Robert R., to Wehr Corporation. Suspended ceiling air distribution arrangement. 3,918,354, Cl. 98-40.00D.

Lamme, Robert E. Combined lock bracket and wheel cover for automotive vehicles. 3,918,764, Cl. 301-37.0AT.

Lammert, Steven R.; and Kukolja, Stjepan, to Eli Lilly and Company. 2,3-Methylenecepham antibiotics. 3,919,209, Cl. 260-243.00C.

Lamprecht, Adolf; and Pohl, Hans, to Rowenta-Werke, GmbH. Lighters. 3,918,887, Cl. 431-255.000.

Lamz, Richard A.; and Schneider, Barry, to Chemtrust Industries Corporation. Foam generating apparatus. 3,918,647, Cl. 239-428.500.

Landwerlin, Michel: *See—*
Villemer, Jean; and Landwerlin, Michel, 3,918,707.

Lang, Donald J.: *See—*
Gindi, Abraham M.; and Lang, Donald J., 3,919,483.

Langhammer, Hans Jurgen, to Klockner-Werke AG. Melting arrangement, particularly for use in the continuous production of steel. 3,919,454, Cl. 13-9.000.

Lapiere, Charles L.; Dejardin, Jean V.; and Mania, Barbara R., to A. Christiaens Societe Anonyme. 4-Hydroxy-5-azacoumarin and derivatives. 3,919,248, Cl. 206-295.00F.

Larribau, Etienne: *See—*
Sahores, Jean; and Larribau, Etienne, 3,919,549.

Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, to Wolff & Kaaber. Polyfuran foams and a method of preparing same. 3,919,127, Cl. 260-2.50F.

Larsen, Richard R., to Bailey Meter Company. Metal bellows welder. 3,918,622, Cl. 228-8.000.

Larson, Rodney L.: *See—*
Petersen, Niel R.; and Larson, Rodney L., 3,918,298.

LaSalle Steel Company: *See—*
Verduzco, Miguel A.; and Dally, James W., 3,918,288.

Laub, Leonard J.: *See—*
Adler, Robert; and Laub, Leonard J., 3,919,465.

Laudick, Richard D. Locator pin. 3,918,694, Cl. 269-47.000.

Laudon, Monique: *See—*
Bugaut, Andree; and Laudon, Monique, 3,919,265.

Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, to Schering Aktiengesellschaft. Pregnanoic acid derivatives and process for the preparation thereof. 3,919,421, Cl. 424-241.000.

Laurer, George J.: *See—*
Kilmer, Charlie C., Jr.; and Laurer, George J., 3,919,447.

Lauterbach, Richard: *See—*
Friedel, Rudolf; and Lauterbach, Richard, 3,919,124.

Lauterstein, Edwin L.: *See—*
Gindy, Irving W.; and Lauterstein, Edwin L., 3,918,266.

Lautier, Dominique Jean; Maeder, Lucien Louis; and Mayer, Pierre Edmund, to Agence Nationale de Valorisation de la Recherche (ANVAR). Controllably self-releasable safety fastener and method of unlocking same. 3,919,563, Cl. 307-119.000.

Lawrence Peska Associates, Inc.: *See—*
Fey, William S.; and Fey, Robert J., 3,918,712.
Peters, Shirley, 3,918,729.
Voulgaris, Anthony, 3,918,612.

Lawrence Wilson & Son Limited: *See—*
Firth, Angus Christopher; and Sheldon, Frederick John, 3,918,734.

Leal-Diaz, Jaime; and Rangel-Garza, Javier. Irrigation systems by trickling. 3,918,646, Cl. 239-271.000.

Lear Motors Corporation: *See—*
Winkler, Max K., 3,918,846.

Lebedeva, Mariya Moiseevna: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.

Lebert, Herbert A. Means and method for directing tobacco toward the wall of a pipe bowl to improve burning action. 3,918,463, Cl. 131-172.000.

Le Carvennec, Francois: *See—*
Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, 3,919,698.

Lechevalier, Robert L.: *See—*
Dukich, Peter P.; Lechevalier, Robert L.; and Volk, John A., 3,919,475.

Leclercq, Alain: *See—*
Alberny, Robert; and Leclercq, Alain, 3,918,467.

Lednicer, Daniel, to Upjohn Company, The. Phenolic diphenylbenzocycloalkenes. 3,919,327, Cl. 260-613.00R.

Lee, Harold Douglas. Sheet fed paper tray paper retaining assembly. 3,918,701, Cl. 271-181.000.

Lee, Henry L., Jr.: *See—*
Huff, Ralph H.; and Lee, Henry L., Jr., 3,919,317.

Lee Inventions, Inc.: *See—*
Lee, William Smith, 3,918,597.

Lee, William Smith, to Lee Inventions, Inc. Method of moving a heavy load. 3,918,597, Cl. 214-152.000.

Lee, Yuan C.; Kline, Jules M.; and Stary, Marvin L., to Environics, Inc. Method and apparatus for collecting and disposing of fuel vapors. 3,918,932, Cl. 55-62.000.

Leesona Corporation: *See—*
Cowan, Larry Clyde, 3,918,677.

Legrand, Maurice, to Societe Anonyme Skis Rossignol. Cross-country ski. 3,918,731, Cl. 280-11.13L.

Le Grow, Gary E.; and Speier, John L., to Dow Corning Corporation. Method of preparing amines and amides. 3,919,276, Cl. 260-448.20E.

Lehan, Frank W.: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 3,919,462.

Lehinant, Armand: *See—*
von der Eltz, Hans-Ulrich; Lehinant, Armand; and Maier, Hans-Peter, 3,918,897.

Lehmann, Ernst; and Prinzing, Robert, to Gema AG Apparatebau. Electrostatic powder coating installation. 3,918,641, Cl. 239-15.000.

Lehmann, Joachim: *See—*
Schmalfeld, Paul; Hahn, Helmut; Lehmann, Joachim; and Kleisa, Kurt, 3,918,929.

Lehmann, Rolf, to Escher Wyss Limited. Bearing housing for a calender. 3,918,775, Cl. 308-193.000.

Lehmann, Rudolf: *See—*
Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, 3,919,045.

Lehrer, Ronald G.: *See—*
Moore, Eugene R.; Lehrer, Ronald G.; Lyons, Charles E.; and McKeever, Leland Dennis, 3,919,354.

Lehtisaari, Lauri. Trailer and towing vehicle coupler guide. 3,918,746, Cl. 280-477.000.

Lehureau, Jean-Claude: *See—*
Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, 3,919,698.

Leinberry, Wilbur Stanley: *See—*
Pauly, Joachim W.; and Leinberry, Wilbur Stanley, 3,918,291.

Lemanski, Bernard. Bean puller. 3,918,243, Cl. 56-229.000.

Lemanski, Savarian F. Selectively wedge clamping tool holder. 3,918,332, Cl. 82-36.00R.

Le Merer, Jean-Pierre: *See—*
Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, 3,919,698.

Lemke, Timothy Allen; and Vogel, Jay Forrest, to AMP Incorporated. Miniature connector for circuit component. 3,918,784, Cl. 339-17.00C.

Lemmers, Eugene, to General Electric Company. Multiple-filament electrodes for electric discharge lamps. 3,919,579, Cl. 313-273.000.

Le Mouel, Bernard, to Societe Lannionnaise d'Electronique Sle-Citerel. Phase differential modulation frequency automatic correcting device. 3,919,651, Cl. 329-104.000.

Le Mouel, Bernard, to Societe Lannionnaise d'Electronique Sle-Citerel. Automatic frequency corrector for differential phase demodulator. 3,919,653, Cl. 329-104.000.

Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Stabilization of alkali metal and/or alkaline earth metal hydrides. 3,919,405, Cl. 423-646.000.

Lenz, George R., to G. D. Searle & Co. 6-Cyanomethylene-3β,5α-17-trihydroxy-17α-pregnane-21-carboxylic acid-γ-lactone and intermediates. 3,919,199, Cl. 260-239.570.

Leo, Heinz, to Messer Griesheim GmbH. Device for feeding gases to a flame cutting machine. 3,918,480, Cl. 137-488.000.

Leonard, Ronald J., to Baxter Laboratories, Inc. Surgical suction device. 3,918,453, Cl. 128-278.000.

Leone, Adolph A.; Polese, Joseph T.; and Polese, Richard. Safety locking device. 3,918,752, Cl. 292-174.000.

Leonichev, Valery Dmitrievich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.

Lerom, Michael W.: *See—*
Acton, Edward M.; Lerom, Michael W.; and Stone, Herbert, 3,919,318.

Le Rouax, Robert K., to Hydril Company. Blowout preventer with locking means. 3,918,478, Cl. 137-315.000.

Letournel, Emile: *See—*
Lagrange, Jean; and Letournel, Emile, 3,918,101.

Leupold & Stevens, Inc.: *See—*
Perry, Donald M., 3,918,791.

Levasseur, Dornis, to Allied Chemical Corporation. Buckle housing. 3,919,508, Cl. 200-61.58B.

Lever Brothers Company: *See—*
Fischer, Wilhelm; Kraush, Friedrich; Riesner, Walter; and Sonnenmoser, Hubert, 3,918,356.
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,919,328.

Leverenz, Klaus; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. 1,2,4-benzotriazinium-dyestuffs. 3,919,214, Cl. 260-248.0AS.

Levy, Jerome F.; Alps, Hugo A.; Alderman, Michael L.; and Templer, David A., to Rohm & Haas Company. Method for finishing leather and leather substitutes. 3,919,451, Cl. 428-310.000.

Lewis, Albert; and Krueger, Ronald G., to Kaiser Glass Fiber Corporation. Method of making unidirectional webbing material. 3,919,028, Cl. 156-148.000.

Lewis, Jean E.: *See—*
Whitten, George R., Jr.; and Lewis, Jean E., 3,918,107.

Leyshon, William E.: *See—*
Brouillette, Joseph W.; and Leyshon, William E., 3,919,558.

Liakumovich, Alexandr Grigorievich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Libbey-Owens-Ford Company: *See—*
Blaine, John C., 3,918,890.
Bobel, Robert J., II; Kimura, Robert B.; and Pollex, Robert C., 3,919,531.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Borchert, Edgar; and Sommer, Karlheinz, 3,919,009.
Borchert, Edgar; and Sommer, Karlheinz, 3,919,010.
Graff, Klaus; and Pieper, Heinrich, 3,919,639.
Minner, Willy, 3,919,568.

Lilly Industries, Ltd.: *See—*
Evans, Delme, 3,919,201.

Lim, Eui Joon, to Triple "A" Accessories, Inc. Flexible motorcycle glove. 3,918,096, Cl. 2-161.00A.

Limberger, Jurgen, heir: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, 3,918,805.

Limberger, Ursula, heir: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, 3,918,805.

Limberger, Walter, deceased; by Limberger, Jurgen, heir; by Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, to Lumoprint Zindler KG. Carriage and coupling arrangement for a document copying machine. 3,918,805, Cl. 355-8.000.

Lin, Kang, to Du Pont de Nemours, E. I., and Company. Process for making 2-cyano-2-hydroxyiminoacetamide salts. 3,919,284, Cl. 260-465.400.

Lindblad, Nero R.; and Werner, Walter F., to Xerox Corporation. Cutting device for elastomeric sheet material. 3,918,337, Cl. 83-409.000.

Linde Aktiengesellschaft: *See—*
Etzbach, Volker; and Muller, Karlheinz, 3,918,265.

Linde, Robert N.: *See—*
Moon, Warren D.; Weiner, Richard J.; Hansen, Robert A.; and Linde, Robert N., 3,919,479.

Lindner, Ernst: *See—*
Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, 3,919,191.

Lindner, Henry; and Kennedy, James D., to Beatrice Foods Co., -Elgin Molded Plastics Div. Retro-reflector construction. 3,918,795, Cl. 350-103.000.

Lindsey, L. E.; and Sammons, Herbert F., to Lindsey Manufacturing Company. Convertible conductor stringing assembly for power line use. 3,918,685, Cl. 254-134.3PA.

Lindsey Manufacturing Company: *See—*
Lindsey, L. E.; and Sammons, Herbert F., 3,918,685.

Lindstrom, Olle B. Fuel treatment for combustion engines. 3,918,412, Cl. 123-3.000.

Lion Fat & Oil Co., Ltd.: *See—*
Nagayama, Masuzo; and Okada, Hiroshi, 3,919,300.
Yamaguchi, Tadashi; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,919,178.

Little, Edwin D.: *See—*
Formaini, Robert L.; and Little, Edwin D., 3,919,144.

Litton Systems, Inc.: *See—*
Tuffias, Robert H., 3,918,773.

Liu, Chain T.: *See—*
Inouye, Henry; and Liu, Chain T., 3,918,965.

Liu, Hsing-Ching, to Kent Industrial Corporation. Writing implement. 3,918,819, Cl. 401-57.000.

Livingston, William L., to Factory Mutual Research Corporation. Non-newtonian liquid and method for wet scrubbing stack gases. 3,918,935, Cl. 55-85.000.

Llewelyn, David Myers, to International Nickel Company, Inc., The. Metal powders. 3,918,955, Cl. 75-.5AA.

Lloyd R. Oliver & Company: *See—*
Oliver, Lloyd R., 3,918,217.

Lloyd, Ronald: *See—*
Dow, James; Lloyd, Ronald; and Patchell, Albert George, 3,919,377.

Loctite (Ireland) Limited: *See—*
O'Sullivan, Denis J.; and Bolger, Bernard J., 3,919,083.

Lodzkie, Zaklady Farmaceutyczne POLFA: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.

Loffler, Franz: *See—*
Lohr, Gunther; Loffler, Franz; and Schaller, Alfred, 3,919,485.

Logemann, Hugo, Jr., to RCA Corporation. Staircase waveform generator. 3,919,649, Cl. 328-186.000.

Logomasini, James C.; and Shelby, Richard K., to Monsanto Company. Apparatus improvements in a rotary blow molding machine. 3,918,872, Cl. 425-308.000.

Logos, Jean. Teaching aid. 3,918,173, Cl. 35-9.00R.

Logwinieko, Roman: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.

Lohr, Gunther; Loffler, Franz; and Schaller, Alfred, to Siemens Aktiengesellschaft. Circuit arrangement for centrally controlled telephone exchange installations having carrier frequency devices. 3,919,485, Cl. 179-15.0BF.

Long, William Joseph, to United States Gypsum Company. Fungicidal dispersion, paper and process. 3,918,981, Cl. 106-15.0AF.

Longley, Peter John; and Gale, Anthony George, to Rolls-Royce (1971) Limited. Blade assembly for a fluid flow machine. 3,918,842, Cl. 416-219.000.

Lonza Ltd.: *See—*
Volker, Theodor; Hering, Klaus; and Dallwigk, Edouard, 3,919,236.

Loop-A-Line, Inc.: *See—*
McGahee, Welbourne D., 3,918,132.

Lopez, Alicia C.: *See—*
Castaneda, Octavio, 3,918,618.

Lord, Michael J.: *See—*
Cooper, Irving B.; Gurrieri, Joseph V.; and Lord, Michael J., 3,919,528.

Lori, Frederick J.: *See—*
Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., 3,918,304.

Loschilov, Vladimir Ivanovich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.

Lotz, Robert W.: *See—*
Pommers, Ansis; and Lotz, Robert W., 3,919,526.

Lowther, Frank Eugene, to Purification Sciences Inc. Corona reactor method and apparatus. 3,919,064, Cl. 204-176.000.

Lubbers, Dietrich W.; and Huch, Albert, to Eschweiler & Co. Method and apparatus for determining the perfusion efficiency factor of animal tissue. 3,918,434, Cl. 128-2.00A.

Lucas Aerospace Limited: *See—*
Smith, Trevor Stanley, 3,918,253.

Lucas, Theodore W., Jr.: *See—*
Fritz, Jack J.; and Lucas, Theodore W., Jr., 3,918,373.

Luce, Curtis L. Telephone transmitter and receiver. 3,919,491, Cl. 179-41.00A.

Lufkin, Martin H.: *See—*
Johnson, Glenn E.; and Lufkin, Martin H., 3,918,836.

Luhowy, Roberta R.; and Meneghini, Frank A., to Polaroid Corporation. Mercaptoethylation of amines. 3,919,277, Cl. 260-430.000.

Lummus Company, The: *See—*
Kohn, Harold B.; and Friedman, George, 3,918,918.

Lumoprint Zindler KG: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, 3,918,805.

Lundquist, Joseph Theodore, Jr.; and Giner, Jose D., to W. R. Grace & Co. Electrochemical system graduated porous bed sections. 3,919,062, Cl. 204-149.000.

Lundstrom, Goran Ingemar; and Andersson, Oswald Karl Gustav, to Hugin Kassaregister AB. Device for feeding a tape. 3,918,656, Cl. 242-67.10R.

Lutron Electronics Co., Inc.: *See—*
Gray, George W., 3,919,592.

Lutus, Paul A., to North American Philips Corporation. Apparatus for obtaining an electrical signal from mechanical motion. 3,919,546, Cl. 250-205.000.

Luwa AG: *See—*
Sutter, Hanspeter, 3,918,674.

Luzzi, John J.: *See—*
Ramey, Chester E.; and Luzzi, John J., 3,919,234.

Lynch, Delmar J.: *See—*
Lynch, John P.; and Lynch, Delmar J., 3,918,204.

Lynch, John P.; and Lynch, Delmar J., to Dolney, Theodore J., a part interest. Gate assembly. 3,918,204, Cl. 49-246.000.
Lyon, Gilbert T. Apparatus for handling articles. 3,918,600, Cl. 214-750.000.
Lyons, Charles E.: *See—*
Moore, Eugene R.; Lehrer, Ronald G.; Lyons, Charles E.; and McKeever, Leland Dennis, 3,919,354.
M & T Chemicals Inc.: *See—*
Habulak, Edward Paul, 3,919,056.
High, Gerald S.; and Dhake, Bhimashanker G., 3,918,984.
Maaghul, John; and Griffiths, David H., to PPG Industries, Inc. Method of controlling glass fiber forming operation. 3,918,947, Cl. 65-3.000.
Macey, Keith S.; and Marciniak, John J., to Harris-Intertype Corporation. Trimmer drive assembly. 3,918,336, Cl. 83-255.000.
Macho, Jan M.; and Oxford, Richard O., to Dial Industries, Inc. Articulated appliance dolly. 3,918,733, Cl. 280-35.000.
Mack-Wayne Plastic Company: *See—*
McIntosh, James A., 3,918,602.
Madden, James E. Mounting for pipes and conduits in studs and joists. 3,918,667, Cl. 248-56.000.
Maeda, Atsushi: *See—*
Hattori, Takeo; Hoya, Yoshio; and Maeda, Atsushi, 3,919,164.
Maeder, Lucien Louis: *See—*
Lautier, Dominique Jean; Maeder, Lucien Louis; and Mayer, Pierre Edmund, 3,919,563.
Maffei, Hector P.; and Borisch, Ronald R., to United States of America, Energy Research and Development Administration. Method of removing bulk sodium from metallic surfaces. 3,918,961, Cl. 75-97.00A.
Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Integrated circuit chip carrier and method for forming the same. 3,918,148, Cl. 29-576.000.
Magdo, Steven: *See—*
Magdo, Ingrid E.; and Magdo, Steven, 3,918,148.
Magnepan, Incorporated: *See—*
Winey, James M., 3,919,499.
Mahlich, Gotthard; and Engelstatter, Heinz, to Braun Aktiengesellschaft. Computer flash apparatus with series-connected control switches. 3,919,594, Cl. 315-241.00P.
Mahneke, Klaus M. Waved-powered driving apparatus. 3,918,260, Cl. 60-500.000.
Mahr, Peter Frank: *See—*
Friedrichsen, Hans Jack; Mahr, Peter Frank; and Schwarz, Alfred Otto, 3,919,503.
Maier, Elmar, to Hilti Aktiengesellschaft. Device for fastening intermediary plates on a mold wall. 3,918,620, Cl. 227-9.000.
Maier, Hans-Peter: *See—*
von der Eltz, Hans-Ulrich; Lehinant, Armand; and Maier, Hans-Peter, 3,918,897.
Maier, Konrad, to Gesellschaft fur Steuerungstechnik mbH & Co. Single-lever control mechanism. 3,918,311, Cl. 74-37.000.
Mail, Issac P., to Combustion Engineering, Inc. Separation of emulsified liquids. 3,919,081, Cl. 210-23.000.
Makino, Takayuki; and Toriyama, Haruhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Axial force measuring method utilizing ultrasonic wave. 3,918,294, Cl. 73-67.200.
Maladzyanova, Larisa Fedorovna: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.
Malatesta, Alberto; and Baldwin, Francis P., to Exxon Research and Engineering Company. Perhalogenated co-butyl rubber. 3,919,131, Cl. 260-5.000.
Malavazos, Arthur J., deceased; and by Malavazos, Gregory A., administrator. Print head for a postage meter. 3,918,361, Cl. 101-91.000.
Malavazos, Gregory A., administrator: *See—*
Malavazos, Arthur J., deceased; and Malavazos, Gregory A., administrator, 3,918,361.
Malcolm, William R., to L. R. Nelson Corporation. Impact and reactant step-by-step rotary sprinkler head. 3,918,643, Cl. 239-230.000.
Maltby, Frederick L., to Drexelbrook Controls, Inc. System for measuring fluid levels in a vehicle transmission. 3,918,306, Cl. 73-304.00C.
Mandula, Joseph M.; Baraona, John P.; and Mates, Chester J., to Republic Steel Corporation. Method and apparatus for rotating a flaw detector about a test piece and guiding it relative to undulations and bends. 3,919,628, Cl. 324-37.000.
Manero, Carlos; Escobar, Miguel; Hershberg, Emanuel B.; and Herzog, Hershel L., to Schering Corporation. Method for increasing diosgenin yield from dioscorea cultivation. 3,918,200, Cl. 47-58.000.
Manesty Machines, Ltd.: *See—*
Crossley, Jack; and Wilson, David Henry, 3,918,873.
Mangold, Dietrich: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,919,282.
Mania, Barbara R.: *See—*
Lapiere, Charles L.; Dejardin, Jean V.; and Mania, Barbara R., 3,919,248.
Mannara, Giuseppe: *See—*
Perla, Giulio; and Mannara, Giuseppe, 3,919,409.
Manning, Robert E.: *See—*
Eberle, Marcel K.; and Manning, Robert E., 3,919,428.
Mano, Hiroshi; and Yamada, Hiroshi, to Ricoh Co., Ltd. Card stacker. 3,918,703, Cl. 271-185.000.
Manzoni, Angelo, to International Standard Electric Corporation. Pulse contact delaying mechanism for telephone dials. 3,919,494, Cl. 179-90.00R.
Marancik, William G.; and Ormand, Frederick T., to Airco, Inc. Method for producing superconducting wire and products of the same. 3,918,998, Cl. 148-11.50R.
Marathon Oil Company: *See—*
Norton, Charles J.; and Falk, David D., 3,919,092.
Marciniak, John J.: *See—*
Macey, Keith S.; and Marciniak, John J., 3,918,336.
Maria Bertens, Theodorus Cornelius Johannes, to U.S. Philips Corporation. Method of manufacturing etched patterns. 3,919,066, Cl. 204-192.000.
Marino, Thomas; Kreeft, John; and Stanislaw, Peter, to Morrison Machine Co. Pivotal rotary screen support and continuous drive therefor. 3,918,362, Cl. 101-115.000.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,919,167, Cl. 260-45.80N.
Markert, Jurgen: *See—*
Hoster, Hansruedi; and Markert, Jurgen, 3,918,902.
Markham, Harry: *See—*
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, 3,919,119.
Maroschak, Ernest J. Method for molding plastic pipe with enlarged portions formed therein. 3,919,367, Cl. 264-40.000.
Marriott, Richard John, to Imperial Chemical Industries Limited. Chemical process. 3,919,314, Cl. 260-562.00R.
Mars, Inc.: *See—*
Fougere, Guy Lloyd; Greene, Walter John; and Jeffreys, Dennis Clifford, 3,918,565.
Heiman, Fred P.; and Herzog, Gerhard, 3,918,564.
Schwippert, Guustaaf Arthur; and Smits, Wouter, 3,918,563.
Marshall, Joseph William: *See—*
Skelton, Charles Roger; Marshall, Joseph William; Oxlade, Roy Ronald; and Gibson, Keith Cyril, 3,918,302.
Martens, Rolf: *See—*
Gaffal, Karl; Honold, Ernst; and Martens, Rolf, 3,918,689.
Marti, Peter: *See—*
Ullmann, Werner; Schumacher, Bernd; Marti, Peter; and Vasalli, Caspar, 3,919,516.
Martin, Billy Otis: *See—*
Peart, Edward Lynn; and Martin, Billy Otis, 3,918,436.
Martin, Carl R.: *See—*
Howlett, Donald L.; Godsey, Ernest E.; and Martin, Carl R., 3,919,657.
Martin, Donald L., to General Electric Company. Nickel-lanthanum alloy produced by a reduction-diffusion process. 3,918,933, Cl. 55-16.000.
Martin, LeRoy, to Pennwalt Corporation. Process for preparing tertiary amyl phenol sulfides in a friable state. 3,919,171, Cl. 260-48.000.
Martin, Therese: *See—*
Carrasse, Jean; Gerard, Jacques; Pounhet, Pierre; and Martin, Therese, 3,918,516.
Marubashi, Kiyonobu; Oshima, Hideji; and Sakano, Yasuaki, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for production of liquid chloroprene polymer. 3,919,281, Cl. 260-455.00B.
Maruyáma, Tadakatsu: *See—*
Sekine, Hiroshi; Maruyama, Tadakatsu; and Yamada, Katsutoshi, 3,918,999.
Maruyama, Tsutomu; and Murata, Koichiro, to Kansai Paint Company, Ltd. Electron-beam radiation-curing method of unsaturated polyesters derived from endomethylene tetrahydrophthalic acid. 3,919,063, Cl. 204-159.150.
Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Tire construction and assembly technique. 3,918,506, Cl. 152-361.00R.
Masaki, Hideyuki: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.
Mason, Peter. Head circumference measuring device. 3,918,166, Cl. 33-179.000.
Masuyama, Isao. Cuckoo clock. 3,918,249, Cl. 58-12.000.
Mates, Chester J.: *See—*
Mandula, Joseph M.; Baraona, John P.; and Mates, Chester J., 3,919,628.
Mathais, Henri: *See—*
Schirmann, Jean-Pierre; Tellier, Pierre; Mathais, Henri; and Weiss, Francis, 3,919,256.
Matsumi, Sho: *See—*
Yamamoto, Minoru; and Matsumi, Sho, 3,918,374.
Matsumoto, Chinami: *See—*
Kato, Masayoshi; Eto, Yoshiyuki; Ikemi, Tadashi; and Matsumoto, Chinami, 3,919,120.
Matsumoto, Norichika: *See—*
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, 3,919,207.
Matsumura, Sakujiro; Yamamura, Tadashi; Ogura, Akira; and Hayashi, Masataka, to Toyo Tire Cord Company Limited. Simultaneous multiple twisting apparatus. 3,918,245, Cl. 57-58.540.
Matsuo, Taisuke: *See—*
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, 3,919,207.
Matsushima, Tomoo; and Odajima, Tsutou, to Showa Denko Kabushiki Kaisha. Process for production of magnesium. 3,918,959, Cl. 75-67.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Asai, Komei; Moriyama, Akio; Tatsuta, Hiroshi; and Fukai, Masakazu, 3,919,106.
Minami, Shunji; and Oka, Shunzo, 3,919,668.
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,919,681.

Mattel, Inc.: *See—*
Benson, John Terry; and White, Peter Charles, 3,918,195.

Matthews, Russell Byron, to Johnson Service Company. Fuel ignition control arrangement. 3,918,881, Cl. 431-46.000.

Mattiussi, Andrea: *See—*
Castelnuovo, Lucio; and Mattiussi, Andrea, 3,919,353.

Mauch, Hans A.; and Smith, Glendon, to United States of America, Veterans Administration. Reflex viewer and tracking aid. 3,918,179, Cl. 35-35.00A.

Maurer, Gottfried, to Gessner A.G. Paper tape to jacquard card repeater head. 3,918,633, Cl. 234-79.000.

Maxemchuk, Nicholas Frank, to RCA Corporation. Loop controller for a loop data communications system. 3,919,484, Cl. 179-15.0AL.

Maxey, Frank S., to Goodyear Tire & Rubber Company, The. Three-component accelerator system. 3,919,179, Cl. 260-79.50C.

Maximov, Vladimir Nikolaevich: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.

Maxwell, Douglas H.: *See—*
Baldwin, James French; and Maxwell, Douglas H., 3,918,964.

Maydew, Randall C.: *See—*
Blackwell, Bennie F.; Feltz, Louis V.; and Maydew, Randall C., 3,918,839.

Mayer, Pierre Edmund: *See—*
Lautier, Dominique Jean; Maeder, Lucien Louis; and Mayer, Pierre Edmund, 3,919,563.

Mayo, Alfred M.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,919,544.

Mazzoni, Renato J.: *See—*
Bowser, George H.; and Mazzoni, Renato J., 3,919,023.

McAllister, Gary Lee, to Northrop Corporation. Optical oscillator-amplifier laser configuration. 3,919,664, Cl. 331-94.50C.

McBride, William R.; Finnegan, William G.; and Adicoff, Arnold, to United States of America, Navy. Propellant composition. 3,919,012, Cl. 149-19.500.

McClain, Furman D. Boat docking device. 3,918,386, Cl. 114-230.000.

McClain, James E.: *See—*
Chaney, Don P.; and McClain, James E., 3,918,786.

McComas, Charles C., to United Technologies Corporation. Abradable seal. 3,918,925, Cl. 29-182.300.

McConnell, David P.: *See—*
Hayes, William H.; and McConnell, David P., 3,919,702.

McConnell, Richard L.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 3,919,176.

McCord Corporation: *See—*
Kargilis, Alexander, 3,918,422.
Rhodes, Richard D., Jr., 3,918,863.

McCormack, Donald H.; and Svab, James E., to Northcutt, Frank Eugene. Automatic gate latch. 3,918,753, Cl. 292-216.000.

McCosker, Doris C. Sanitary face mask. 3,918,448, Cl. 128-146.600.

McDonald, Charles H.: *See—*
Winters, Robert E.; and McDonald, Charles H., 3,919,148.

McDonnell Douglas Corporation: *See—*
McGuire, Joseph C., 3,918,142.
Murphy, Dennis E.; and Smith, Larry David, 3,918,755.

McFarland, James W., to Pfizer Inc. Antibacterial acylaminoquinoxalinecarboxamide 1,4-dioxides. 3,919,224, Cl. 260-250.0QN.

McGahee, Welbourne D., to Loop-A-Line, Inc. Rubber band holder. 3,918,132, Cl. 24-241.0SL.

McGavic, John P.: *See—*
Gambill, Charles C.; and McGavic, John P., 3,918,417.

McGraw-Edison Company: *See—*
Buschman, Jerome, 3,918,214.
Enters, Robert F., 3,918,990.
Racenis, Karlis V., 3,918,457.
Wadia, Gurinder S.; and Gill, Harnek S., 3,919,523.

McGuire, Joseph C., to McDonnell Douglas Corporation. Method of fabricating a vent structure. 3,918,142, Cl. 29-420.000.

McHard, James A.: *See—*
Bennett, Donald R.; and McHard, James A., 3,919,417.

McIntosh, James A., to Mack-Wayne Plastic Company. Tamperproof closure. 3,918,602, Cl. 215-219.000.

McIntosh, Robert H.; and Hull, Ezekiel H., to Askew, Anthony B. Sanitizing plastic material. 3,919,410, Cl. 424-78.000.

McKay, Randolph. Axle gear drive. 3,918,328, Cl. 74-665.00F.

McKeever, Leland Dennis: *See—*
Moore, Eugene R.; Lehrer, Ronald G.; Lyons, Charles E.; and McKeever, Leland Dennis, 3,919,354.

McKinley, Suzanne V.: *See—*
Rakshys, Joseph W., Jr.; and McKinley, Suzanne V., 3,919,126.

McLain, Charles D., to Olin Corporation. Method of fabricating patterned tubing from metallic strip. 3,918,626, Cl. 228-147.000.

McMurray, William; Plunkett, Allan B.; and Stitt, Thomas D., to General Electric Company. Inverter adaptive lock-out technique. 3,919,620, Cl. 321-13.000.

McNary, James F.; Hicks, Edward C.; and Ozudogru, Yilmaz H., to Global Marine Inc. Gimbal support system for deep ocean mining vessel. 3,918,379, Cl. 114-.50D.

McQueary, Hobert O.: *See—*
Shoemaker, Philip D.; and McQueary, Hobert O., 3,919,017.

Meacham, James H., to Westinghouse Electric Corporation. Subminiature television camera. 3,919,597, Cl. 315-382.000.

Mead Johnson & Company: *See—*
Comer, William T.; and Roth, Herbert R., 3,919,424.

Meader, Royal A., Jr.: *See—*
Petersen, Kenneth C.; and Meader, Royal A., Jr., 3,919,181.

Mebus, Charles A., to Board of Regents of the University of Nebraska, The. Vaccine for neonatal calf diarrhea. 3,919,412, Cl. 424-89.000.

Mebus, Charles A., to Board of Regents of the University of Nebraska, The. Vaccine for neonatal calf diarrhea. 3,919,413, Cl. 424-89.000.

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Medtronic, Inc.: *See—*
King, Wendell L.; and Stokes, Kenneth B., 3,918,460.

Meier, Johann, to Precise AG Rechenmaschinenfabrik. Pivot bearing. 3,918,771, Cl. 308-2.00A.

Meijerink, Theo A. J.: *See—*
Dahlmans, Johannes J.; and Meijerink, Theo A. J., 3,919,048.

Melcher, Robert L.: *See—*
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., 3,919,700.

Melnick, Joseph L.; and Wallis, Craig, to Armour Pharmaceutical Company. Processes for concentrating and purifying viruses and viral antigens. 3,919,044, Cl. 195-1.500.

Meneghini, Frank A.: *See—*
Luhowy, Roberta R.; and Meneghini, Frank A., 3,919,277.

Mengel, Klaus: *See—*
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.

Mercier, Andre, to Fives-Cail Babcock. Discharge means in a centrifugal drier. 3,918,170, Cl. 34-58.000.

Merck & Co., Inc.: *See—*
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,919,253.

Merkle, Hans Rupert; and Siegel, Hardo, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Preparation of 2,5-dimethylfuran-3-carboxylic esters. 3,919,261, Cl. 260-347.500.

Merloz, Pierre: *See—*
Galves, Jean-Pierre; and Merloz, Pierre, 3,919,584.

Merrill, Duane F.; and Cooke, Richard C., Jr., to General Electric Company. Silanol-free resins. 3,919,344, Cl. 260-825.000.

Merriman, Henry H. Nail retaining cutter. 3,918,156, Cl. 30-151.000.

Mertens, Gottfried: *See—*
Stanke, Walter; and Mertens, Gottfried, 3,918,894.

Mertens, Ludovicus Maria, to Agfa-Gevaert. Process and materials for the information-wise production of amino compounds. 3,918,973, Cl. 96-48.00R.

Messer Griesheim GmbH: *See—*
Leo, Heinz, 3,918,480.

Messerschmitt-Bolkow-Blohm G.m.b.H.: *See—*
Born, Gunthard, 3,919,662.

Metallgesellschaft Aktiengesellschaft: *See—*
Hardt, Lothar, 3,918,939.
Kriebel, Manfred; and Hochgesand, Gerhard, 3,918,934.
Schmalfeld, Paul; Hahn, Helmut; Lehmann, Joachim; and Kleisa, Kurt, 3,918,929.

Metcalfe, Kenneth A.; Clements, Alwin S.; and Horrocks, Brian J., to Commonwealth of Australia care of The Secretary, Department of Supply, The. Liquid development of an electrical image in which a pulsating field is employed. 3,918,966, Cl. 96-1.0LY.

Meyer, Dean A.: *See—*
Haffner, Donald G.; Meyer, Dean A.; Ecker, Franklin A.; and Akgulian, Sahag C., 3,918,240.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Process for preparing 2-amino-1,4-dihydropyridine derivates. 3,919,246, Cl. 260-294.900.

Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., to Eastman Kodak Company. Water-dispersible polyolefin compositions useful as hot melt adhesives. 3,919,176, Cl. 260-78.40D.

Meyer, Rich B.; and Shuman, Dennis A., to ICN Pharmaceuticals. 5-Amino-4-substituted imidazole nucleotides. 3,919,192, Cl. 260-211.50R.

Meyer, Roy E.: *See—*
Wahl, John F.; and Meyer, Roy E., 3,919,522.

Meyers, George L., to American Can Company. Tray with reinforced corner construction and blank therefor. 3,918,630, Cl. 229-35.000.

Mian, Abdul M.; and Robins, Roland K., to ICN Pharmaceuticals. 3-Deazaguanosine and derivatives thereof. 3,919,193, Cl. 260-211.50R.

Michalko, Edward, to Universal Oil Products Company. Method of preparing alumina spheres. 3,919,117, Cl. 252-448.000.

Michel, Walter: *See—*
Krueger, Friedrich; and Michel, Walter, 3,919,297.

Michetti, Anthony B.: *See—*
Strobel, Albert; and Michetti, Anthony B., 3,919,514.

Microwave Associates, Inc.: *See—*
Posner, Ronald Sheldon; and Walker, Richard Marion, 3,919,666.

Middleton, Charles F., Jr., to Modicon Corporation. Safety interlock for power switch of interconnected units. 3,919,507, Cl. 200-50.00A.
Mieda, Fumio, to Keio Giken Kogyo Kabushikikaisha. Monophonic electronic musical instrument of equal tempered scale. 3,918,342, Cl. 84-1.010.
Mihalik, Nandor; and Shreeve. Nicholas Gilbert, to Gestetner Byfleet Limited. Copier and sheet stripping finger therefor. 3,918,702, Cl. 271-174.000.
Mikitenko, Paul: *See—*
Cohen, Georges; Gracco, Francis; and Mikitenko, Paul, 3,919,078.
Miko, Steven J.: *See—*
Milberger, Ernest C.; Dolhyj, Serge R.; and Miko, Steven J., 3,919,257.
Milani, Humbert, to Sheeley, Robert M.; and Sheeley, Larry M. Hearing aid device. 3,918,550, Cl. 181-135.000.
Milberger, Ernest C.; Dolhyj, Serge R.; and Miko, Steven J., to Standard Oil Company, The. Catalytic vapor phase oxidation of n-butene to maleic anhydride using two different catalysts maintained in two distinct and separate portions of the reaction zone. 3,919,257, Cl. 260-346.800.
Miles Laboratories, Inc.: *See—*
Beall, Glenn Lee; and White, Fred K., 3,918,435.
Vidrio, Horacio, 3,919,425.
Miles, Peter: *See—*
Richardson, Norman; Jones, Thomas Ivor; and Miles, Peter, 3,919,258.
Millar, Daniel J. Electro-hydraulic jack. 3,918,683, Cl. 254-93.00R.
Miller, Calvin Max, to Bell Telephone Laboratories, Incorporated. Optical fiber splicing apparatus. 3,919,037, Cl. 156-502.000.
Miller, Donald G., to American Pulverizer Company. Liners for shredding machines. 3,918,649, Cl. 241-189.00R.
Miller, Howard R.: *See—*
Crosley, Thomas W.; and Miller, Howard R., 3,919,504.
Miller, Jacob I.: *See—*
Sommer, Harold Z.; and Miller, Jacob I., 3,919,240.
Sommer, Harold Z.; and Miller, Jacob I., 3,919,241.
Miller, John H., III: *See—*
Girdner, William I.; and Miller, John H., III, 3,918,152.
Miller, Laurence L., to TRW Inc. Gerotor fluid controller with twistable blade energy storing means. 3,918,856, Cl. 418-61.00B.
Miller, Nan C.; and Murset, Susie J. Game device. 3,918,174, Cl. 35-9.00R.
Miller, Richard P.: *See—*
Shaw, Bevil J.; and Miller, Richard P., 3,918,100.
Millhollan, Michael S.; and Treadway, Ronald L., to Motorola, Inc. Sense-write circuit for bipolar integrated circuit ram. 3,919,566, Cl. 307-235.00R.
Milliman, Bruce A.: *See—*
Best, Howard S.; Milliman, Bruce A.; and Zak, Edward J., 3,918,216.
Mills, John E., to Harman International Industries, Inc. Cross arm mirror mount. 3,918,319, Cl. 74-491.000.
Milton, A. Fenner, to United States of America, Navy. Liquid crystal optical switch coupler. 3,918,794, Cl. 350-96.00C.
Mimata, Tsutomu; and Yuzawa, Ryozo, to Hitachi, Ltd. Bonding equipment and method of bonding. 3,918,144, Cl. 228-205.000.
Minami, Shunji; and Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Device for generating variable voltage. 3,919,668, Cl. 331-130.000.
Minami, Teruo, to Kabushiki Kaisha Komatsu Seisakusho. Control valves for steering clutches and brakes. 3,918,488, Cl. 137-596.160.
Minervini, Mauro: *See—*
Zamboni, Leopoldo; Minervini, Mauro; and Zifferero, Marcello, 3,918,469.
Minner, Willy, to Licentia Patent-Verwaltungs-GmbH. Circuit for the preferential starting of a stage of an electronic sequence having a holding circuit. 3,919,568, Cl. 307-296.000.
Minnesota Mining and Manufacturing Company: *See—*
Coraluppi, Enzo; de Saraca, Elio; and Vittore, Lorenzo, 3,918,975.
Filson, John Richard, 3,918,790.
Schoon, David J., 3,919,545.
Stevens, Edward J., 3,919,559.
Minolta Camera Kabushiki Kaisha: *See—*
Yata, Kotaro; and Ueda, Hiroshi, 3,919,538.
Missouri Farmers Association, Inc.: *See—*
Walser, Ronald D.; and Edmisson, Jerry L., 3,918,588.
Mita Industrial Company, Ltd.: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.
Mitchell, William A.; and Seidel, William C., to General Foods Corporation. Alcohol-containing oral hygiene powders. 3,919,408, Cl. 424-49.000.
Mitchell, William E., to Dunlop Limited. Tire and wheel assembly. 3,918,507, Cl. 152-379.000.
Mitchell, William Eric, to Dunlop Limited. Wheel rim assemblies. 3,918,508, Cl. 152-381.000.
Mitchell, William O.: *See—*
Warnock, Emmit F.; Williamson, Bobby Wayne; Ellington, Gordon H.; and Mitchell, William O., 3,918,335.
Mitsubishi Chemical Industries Ltd.: *See—*
Onoda, Takeru; Ohno, Akihisa; and Shiraga, Ken, 3,919,294.
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, 3,919,185.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kitaoka, Takashi; Shirane, Yasuhiro; and Yamada, Junzo, 3,918,369.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Hattori, Takeo; Hoya, Yoshio; and Maeda, Atsushi, 3,919,164.
Mitsubishi Rayon Co., Ltd.: *See—*
Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, 3,919,157.
Mitsui Petrochemical Industries, Ltd.: *See—*
Shindo, Masatoshi; Tsuchiya, Shiro; and Takegami, Kazuo, 3,918,892.
Mitsui Petrochemical Industry Co., Ltd.: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.
Miyamoto, Masao: *See—*
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,918,953.
Miyaoka, Senri: *See—*
Izumisawa, Masato; and Miyaoka, Senri, 3,919,712.
Miyasaka, Matsuho: *See—*
Ishiguro, Juichi; Miyasaka, Matsuho; and Kitajima, Nobumitsu, 3,918,623.
Miyashita, Akitoshi: *See—*
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,919,681.
Miyata, Yoshio: *See—*
Katagiri, Yoshio; and Miyata, Yoshio, 3,919,105.
Miyawaki, Toshio: *See—*
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, 3,919,207.
Mizobuchi, Toshio: *See—*
Suzuki, Kenzo; Mizobuchi, Toshio; and Kase, Makoto, 3,918,957.
Mizuno, Shogo, to Dai Nippon Printing Company Limited. Transfer printing method. 3,918,895, Cl. 8-2.500.
Mizusawa, Akira, to Nifco Inc. Bar antenna holder. 3,918,671, Cl. 248-285.000.
Mizutani, Tadashi; and Ono, Soshiro, to Kuraray Plastics Company, Limited. Flexible hose manufacturing process. 3,919,026, Cl. 156-143.000.
MI^2: *See—*
Fretwell, Richard D., 3,919,650.
Mlodoch, Irving A. Sport glove. 3,918,097, Cl. 2-161.00A.
Mo Och Domsjo Aktiebolag: *See—*
Brown, Michael Alwyn; and Jangestrand, Gert Harald Leopold, 3,919,364.
Mobil Oil Corporation: *See—*
Cushman, Donald R.; and Schick, John W., 3,919,149.
Davis, Robert H.; Oberright, Edward A.; and Schick, John W., 3,919,093.
Okorodudu, Abraham O. M., 3,919,095.
Olszewski, William Frank, 3,919,096.
Snavely, Earl S., Jr.; and Bertness, Theodore A., 3,918,521.
Mobility, Inc.: *See—*
Gay, James E., 3,918,744.
Mobley, Burton L.: *See—*
Pullen, Joseph B.; and Mobley, Burton L., 3,919,403.
Modicon Corporation: *See—*
Middleton, Charles F., Jr., 3,919,507.
Mogi, Hiroya: *See—*
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, 3,919,436.
Mohler, Hans, to Jomos- Sprinkler-Material AG. Sprinkler valves. 3,918,645, Cl. 239-498.000.
Mohsen, Amr Mohamed; and Sequin, Carlo Heinrich, to Bell Telephone Laboratories, Incorporated. Method of fabricating uniphase charge coupled devices. 3,918,997, Cl. 148-1.500.
Molev, Igor Ivanovich: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.
Molins Machine Company, Inc.: *See—*
Osgood, John H., 3,919,029.
Mollet, Prudent Eduardus Jacobus: *See—*
Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, 3,919,470.
Molloy, Bryan B., to Eli Lilly and Company. 2-Aminodichlorotetralins. 3,919,316, Cl. 260-578.000.
Monarch Marking Systems, Inc.: *See—*
Finke, Eugene W., 3,918,351.
Grushon, Harold N., 3,918,143.
Monark-Crescent AB: *See—*
Kaufeldt, Roland T. A., 3,918,593.
Monsanto Company: *See—*
Corey, Albert E.; and Donermeyer, Donald D., 3,919,449.
Higginbottom, Harold P., 3,919,134.
Logomasini, James C.; and Shelby, Richard K., 3,918,872.
Tilford, Baxter L., 3,919,431.
Trivette, Chester D., Jr.; Vanderkooi, John P.; and Genetti, Ralph A., 3,919,132.
Montagnino, James G., to Pitney-Bowes, Inc. Drive mechanism. 3,918,313, Cl. 74-393.000.
Montecatini Edison S.p.A.: *See—*
Castelnuovo, Lucio; and Mattiussi, Andrea, 3,919,353.
Monzi, Tulio J., to PPG Industries, Inc. Method of maintaining paired glass sheets in alignment during bending. 3,918,948, Cl. 65-25.00R.

Moody, Harold W., Jr.; and Bulkley, Clifford T., to Dunham-Bush, Inc. Metal reinforced plastic helical screw compressor rotor. 3,918,838, Cl. 416-176.000.

Moon, Warren D.; Weiner, Richard J.; Hansen, Robert A.; and Linde, Robert N., to First National Bank of Boston, The. Broadcast signal identification system. 3,919,479, Cl. 179-1.05B.

Mooney, Leonard J.; and Hyatt, Hugh M., to United States of America, Energy Research and Development Administration. Relativistic electron beam generator. 3,919,580, Cl. 313-310.000.

Moore, Eugene R.; Lehrer, Ronald G.; Lyons, Charles E.; and McKeever, Leland Dennis, to Dow Chemical Company, The. Impact resistant polymers of a resinous copolymer of an alkenyl aromatic monomer and unsaturated dicarboxylic anhydride. 3,919,354, Cl. 260-880.00R.

Moore, Gordon G.: *See—*
Rothman, Edward S.; and Moore, Gordon G., 3,919,275.

Moore, Harry B.: *See—*
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., 3,919,439.

Moore, Raymond H., to United States of America, Interior. Process and composition for cleaning hot fuel gas. 3,919,390, Cl. 423-210.500.

Moran, Richard J.: *See—*
Brown, Alfred W.; and Moran, Richard J., 3,919,437.

Morane, Bruno P., to Societe Anonyme dite: L'Oreal. Dispensing cap for aerosols and mold for making same. 3,918,615, Cl. 222-402.130.

Moreau, Richard, to Hydro-Quebec. Method and apparatus for determining geodesic measurements by helicopter. 3,918,172, Cl. 356-4.000.

Morgan, Eugene L., to Hy-Gain Electronics Corporation. Scanning receiver. 3,919,646, Cl. 325-470.000.

Morgan, Ian H., to Texas Instruments Incorporated. Formation of integrated circuits using proton enhanced diffusion. 3,918,996, Cl. 148-1.500.

Morgan, Ward; Weiner, Gerald H.; and Raff, Ronald D., to Health Kit Corporation. Dental tool control assembly. 3,918,161, Cl. 32-22.000.

Morgardshammar Aktiebolag: *See—*
Bjorkman, Bengt-Olof, 3,918,287.

Mori, Hideo: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, 3,919,239.

Mori, Takeshi, to Christensen Diamond Products Company. Apparatus for milling faces of masonry blocks. 3,918,210, Cl. 51-80.00A.

Mori, Yoshiharu: *See—*
Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, 3,919,363.

Moriarty, Joseph A.: *See—*
Barlow, Fred D., Jr.; and Moriarty, Joseph A., 3,919,307.

Moriyama, Akio: *See—*
Asai, Komei; Moriyama, Akio; Tatsuta, Hiroshi; and Fukai, Masakazu, 3,919,106.

Morrette, Richard A.: *See—*
Kontz, Robert F.; and Morrette, Richard A., 3,919,375.

Morrien, Albertus Marinus, to U.S. Philips Corporation. Split-phase signal detector. 3,919,652, Cl. 329-104.000.

Morris, Roger E., to B. F. Goodrich Company, The. Vulcanizable compositions containing halogen-bearing elastomeric polymers. 3,919,143, Cl. 260-18.00R.

Morrison Machine Co.: *See—*
Marino, Thomas; Kreeft, John; and Stanislaw, Peter, 3,918,362.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,919,231.
Spencer, Claude F.; and Snyder, Harry R., Jr., 3,919,238.

Mose, Luciano, to Friedrich Uhde, GmbH. Seal for anode stems in an electrolysis cell. 3,919,071, Cl. 204-286.000.

Motorola, Inc.: *See—*
Horzick, Joseph, 3,918,577.
Millhollan, Michael S.; and Treadway, Ronald L., 3,919,566.
Wechsler, Reuben, 3,919,621.

Mottram, Brian John: *See—*
Jury, Kenneth James; and Mottram, Brian John, 3,918,220.

Moult, Roy H.; and Colligan, John J., to Koppers Company, Inc. Preparation of low free resorcinol containing resorcinol-phenol copolymer resins. 3,919,151, Cl. 260-29.300.

Moyer, Rudolph H.; and Sibbett, Donald J., to Geomet, Incorporated. Method for prothrombin testing. 3,918,908, Cl. 23-230.00B.

MTS Systems Corporation: *See—*
Petersen, Niel R.; and Larson, Rodney L., 3,918,298.

Muccillo, Edwin J.: *See—*
Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., 3,918,284.

Muller, Anton, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Wear link for tire chains. 3,918,505, Cl. 152-243.000.

Muller, Helmuth, to Kienzle Apparate GmbH. Number wheel for counters. 3,918,634, Cl. 235-1.00C.

Muller, Karlheinz: *See—*
Etzbach, Volker; and Muller, Karlheinz, 3,918,265.

Mulraney, David: *See—*
Eichenberger, Walter; Mulraney, David; and Reese, Melton E., 3,918,866.

Multiform Desiccant Products, Inc.: *See—*
Cullen, John S.; and Huber, Paul W., 3,918,578.

Munchenberg, Gunter: *See—*
Hattwig, Peter; and Munchenberg, Gunter, 3,918,553.

Munzel, Howard E.: *See—*
Kukla, William J.; and Munzel, Howard E., 3,918,968.

Murai, Mikio: *See—*
Yumde, Yasufumi; Narita, Sho; Murai, Mikio; and Kubota, Takashi, 3,919,716.

Murakami, Nanami: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, 3,919,239.

Murata, Hiroshi: *See—*
Ashina, Yoshiro; Narita, Takeshi; and Murata, Hiroshi, 3,919,125.

Murata Kikai Kabushiki Kaisha: *See—*
Uchida, Hiroshi, 3,918,651.

Murata, Koichiro: *See—*
Maruyama, Tsutomu; and Murata, Koichiro, 3,919,063.

Murayama, Tuneyasu: *See—*
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., to National Distillers and Chemical Corporation. Haloberyllium hydride-Lewis base complexes. 3,919,320, Cl. 260-583.00R.

Murillo, Daniel. Auxiliary oil drip pan for a vehicle or the like. 3,918,542, Cl. 180-69.100.

Murphy, Dennis E.; and Smith, Larry David, to McDonnell Douglas Corporation. Hold-open latch assembly. 3,918,755, Cl. 292-256.000.

Murphy, Milo E., to Murphy Muffler, Inc. Sound damping apparatus. 3,918,549, Cl. 181-57.000.

Murphy Muffler, Inc.: *See—*
Murphy, Milo E., 3,918,549.

Murset, Susie J.: *See—*
Miller, Nan C.; and Murset, Susie J., 3,918,174.

N. V. Bekaert S.A.: *See—*
Kemel, Noel, 3,918,650.

N. V. Klippan S.A.: *See—*
Beller, Herbert R., 3,918,658.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,919,323.

Nagai, Yawara: *See—*
Soya, Isao; Kimura, Katsuhiko; Nobuto, Tooru; and Nagai, Yawara, 3,918,910.

Nagatomo, Masatugu, to Kabushiki Kaisha Komatsu Seisakusho. Automatically adjusting braking device. 3,918,556, Cl. 188-77.00R.

Nagayama, Masuzo; and Okada, Hiroshi, to Lion Fat & Oil Co., Ltd. Detergent composition and method for preparing same. 3,919,300, Cl. 260-513.00R.

Naidenov, Georgy Fedorovich: *See—*
Sigal, Isaak Yakovlevich; Naidenov, Georgy Fedorovich; Nizhnik, Sergei Savatievich; and Gurevich, Nikolai Alexandrovich, 3,918,834.

Naidus, Edward Sidney, to RCA Corporation. Thermoplastic heat responsive fire vent apparatus. 3,918,226, Cl. 52-232.000.

Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, to Otsuka Pharmaceutical Co., Ltd. Oxazolidine derivatives. 3,919,239, Cl. 260-288.0CE.

Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, to Sony Corporation. Tone arm. 3,918,722, Cl. 274-23.00R.

Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, to Sony Corporation. Cantilever for use with pickup cartridge. 3,918,723, Cl. 274-37.000.

Nakamura, Takashi, to Sony Corporation. Color television camera. 3,919,713, Cl. 358-32.000.

Nakamura, Tokuro: *See—*
Kikugawa, Kiyomi; Suehiro, Hideo; Ichino, Motonobu; and Nakamura, Tokuro, 3,919,194.

Nakamura, Yasuo: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.

Nakamura, Zenzo, to Canon Kabushiki Kaisha. Flash safety device in a flash apparatus. 3,919,593, Cl. 315-241.00P.

Nakk, Lembit, to SKF Industrial Trading and Development Company B.V. Bearing assembly. 3,918,277, Cl. 68-140.000.

Nalco Chemical Company: *See—*
Dubrow, Paul L., 3,919,016.
Vartiak, Joseph F., 3,918,904.
Zamboni, Leopoldo; Minervini, Mauro; and Zifferero, Marcello, 3,918,469.

Nakajima, Taketoshi: *See—*
Toshimitsu, Itaru; Fujii, Sakumi; and Nakajima, Taketoshi, 3,919,396.

Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, to Thomson-CSF. Route surveillance system. 3,919,686, Cl. 340-24.000.

Narita, Sho: *See—*
Yumde, Yasufumi; Narita, Sho; Murai, Mikio; and Kubota, Takashi, 3,919,716.

Narita, Takeshi: *See—*
Ashina, Yoshiro; Narita, Takeshi; and Murata, Hiroshi, 3,919,125.

Narita, Teruo, to Ricoh Co., Ltd. Photoreceptor cleaning device for electrophotographic copying apparatus of the dry cleaning agent type. 3,918,808, Cl. 355-15.000.

Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., to Walt Disney Productions. Monitor system for sensing discrete points. 3,919,696, Cl. 340-172.500.

National Distillers and Chemical Corporation: *See—*
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,919,320.

Nauman, Edward F.: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,919,110.

Nausedas, Joseph A., to Union Carbide Corporation. Pivoted wicket bag opening dispenser. 3,918,589, Cl. 211-57.000.

Nazemi, Malek M. Assembly for specimen culturing. 3,919,053, Cl. 195-139.000.

Neail, William R.; and Rahm, Clifford A., to Perkins Research & Mfg. Co. Moisture proof cable splice employing hydrophobic powder. 3,919,460, Cl. 174-87.000.

Neff, Clarence H.: *See—*
Czernik, Daniel E.; and Neff, Clarence H., 3,918,165.

Nelson, Charles M. Auto track. 3,918,638, Cl. 238-14.000.

Nelson, Leroy D.: *See—*
Koch, Robert B.; Nelson, Leroy D.; and Rork, Gerald D., 3,919,051.

Nelson, Norman A.: *See—*
Putch, Samuel W., 3,918,747.

Nelson, Philip E.: *See—*
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,678.
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,942.

Nemeth, Bela J.; and Burghardt, Alden M., to Kennametal Inc. Metallurgical composition embodying hard metal carbides, and method of making. 3,918,138, Cl. 29-182.700.

Nemoto, Koji, to Kabushiki Kaisha Seikosha. Transistor driving circuit for movable element. 3,919,606, Cl. 318-128.000.

Neo-Dyne Industries, Inc.: *See—*
Feigel, Harold J., 3,918,293.

Nethery, Howard J. Process and apparatus for cryostatic pre-operative treatment of gangrenous extremeties. 3,918,458, Cl. 128-400.000.

Neubauer, Frank H., to Transkrit Corporation. Pouched continuous envelope system. 3,918,632, Cl. 229-69.000.

Neumiller, Phillip J., to I. C. Johnson & Son, Inc. High analysis clear lawn fertilizer solution. 3,918,952, Cl. 71-28.000.

Neuner, James A.: *See—*
Einolf, Charles W., Jr.; and Neuner, James A., 3,919,533.

Neville Chemical Company: *See—*
Henderson, Albert J.; and Krol, John E., 3,919,338.

Newman, Cyril Leslie: *See—*
Phillipson, Alan; Spiller, Basil Harry Royston; Newman, Cyril Leslie; and Smith, Robin, 3,918,875.

Nicholson, Charles B., to Albany International Corporation. Bowed roll. 3,918,774, Cl. 308-187.000.

Niebojewski, Frank J. Rowing lever exercise apparatus. 3,918,710, Cl. 272-81.000.

Niecke, Ronald. Power belt. 3,919,615, Cl. 320-2.000.

Niederprum, Hans: *See—*
Roesky, Herbert Walter; Niederprum, Hans; and Wechsberg, Manfred, 3,919,301.
Wechsberg, Manfred; and Niederprum, Hans, 3,919,295.

Niedrach, Leonard W.: *See—*
Carson, William N., Jr.; and Niedrach, Leonard W., 3,919,067.

Niegisch, Walter D.: *See—*
Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., 3,919,163.

Nifco Inc.: *See—*
Hara, Kunio, 3,918,129.
Mizusawa, Akira, 3,918,671.

Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Process for the diazo-type multicolor reproduction. 3,918,974, Cl. 96-49.000.

Niizuma, Jiro: *See—*
Hattori, Yasuzo; and Niizuma, Jiro, 3,918,526.

Nikken Chemicals Co., Ltd.: *See—*
Hiraiwa, Takashi, 3,918,986.

Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich. Surgical instrument for ultrasonic joining of biological tissue. 3,918,442, Cl. 128-92.00G.

Nikolaus, Peter: *See—*
Eckert, Hans-Werner; Nikolaus, Peter; and Schwarzer, Johann, 3,919,091.

Nippert Company, The: *See—*
Nippert, Russell A., 3,918,625.

Nippert, Russell A., to Nippert Company, The. Method of making a double extruded semiconductor joint. 3,918,625, Cl. 228-136.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Yamamoto, Minoru; and Matsumi, Sho, 3,918,374.

Nippon Rutsubo Kabushiki Kaisha: *See—*
Kurihara, Toshimasa, 3,918,624.

Nippon Steel Corporation: *See—*
Ishizaki, Keizo; and Fujimori, Sigeo, 3,919,517.
Sekine, Hiroshi; Maruyama, Tadakatsu; and Yamada, Katsutoshi, 3,918,999.

Nippon Unitol Co., Ltd.: *See—*
Ashina, Yoshiro; Yamaguchi, Yasumasa; and Fujiwara, Atushi, 3,918,917.
Ashina, Yoshiro; Narita, Takeshi; and Murata, Hiroshi, 3,919,125.

Nippondenso Co., Ltd.: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.

Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, to Matsushita Electric Industrial Co., Ltd. Combined variable resistor assembly provided with position indicator means. 3,919,681, Cl. 338-119.000.

Nishiwaki, Fukujiro; and Yoshino, Tomii, to C. Kondo & Co., Ltd. Tucking apparatus for curtain or like cloth. 3,918,376, Cl. 112-121.150.

Nissan Chemical Industries, Ltd.: *See—*
Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, 3,919,363.

Nissan Motor Company Limited: *See—*
Kato, Masayoshi; Eto, Yoshiyuki; Ikemi, Tadashi; and Matsumoto, Chinami, 3,919,120.

Nissel, Frank R., to Welex Incorporated. Coextrusion system. 3,918,865, Cl. 425-131.100.

Nitto Chemical Industry Co., Ltd.: *See—*
Ashina, Yoshiro; Yamaguchi, Yasumasa; and Fujiwara, Atushi, 3,918,917.
Ashina, Yoshiro; Narita, Takeshi; and Murata, Hiroshi, 3,919,125.
Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, 3,919,157.

Nizhnik, Sergei Savatievich: *See—*
Sigal, Isaak Yakovlevich; Naidenov, Georgy Fedorovich; Nizhnik, Sergei Savatievich; and Gurevich, Nikolai Alexandrovich, 3,918,834.

Noack, Dieter, to Siemens Aktiengesellschaft. High-voltage apparatus such as a circuit breaker or the like equipped with means for preventing impairment of the electric field within the apparatus enclosure. 3,919,511, Cl. 200-148.00R.

Noah, Russell V., to Greer Hydraulics, Inc. Ship section transfer assembly. 3,918,366, Cl. 104-1.00R.

Noble, David Stanley: *See—*
Silverstone, Calvin Eric; and Noble, David Stanley, 3,918,517.

Nobuto, Tooru: *See—*
Soya, Isao; Kimura, Katsuhiko; Nobuto, Tooru; and Nagai, Yawara, 3,918,910.

Noguchi, Hikoji. Apparatus for supplying eggs and the like. 3,918,571, Cl. 198-25.000.

Noll, A. Michael, to Bell Telephone Laboratories, Incorporated. Tactile man-machine communication system. 3,919,691, Cl. 340-172.500.

Nolte, Albert C., Jr., to Elton Industries, Inc. Liquid crystal-containing magnetized article for visually indicating the recording of a magnetic signal. 3,919,718, Cl. 360-131.000.

Nonaka, Hiroshi; Usugi, Kikuo; Okada, Masataka; and Iwasaki, Shoji, to Clarion Company Limited. Game apparatus for trying coincidence between randomly selected characters. 3,918,716, Cl. 273-138.00A.

Nooi, Jacobus, to Heterochemical Corporation. Molecular complexes of a bis-(5-nitrofurfurylidene)-acetoneguanylhydrozone compound and an amine. 3,919,426, Cl. 424-251.000.

Nopper, Peter, to Zumbach Electronic-Automatic. Method and apparatus for locating a continuously moving web. 3,919,560, Cl. 250-557.000.

Norbury, John: *See—*
Gill, Wendy Rawstron; and Norbury, John, 3,919,033.

Noren, Don W., to Noren Products, Inc. Emergency light. 3,919,543, Cl. 240-46.010.

Noren Products, Inc.: *See—*
Noren, Don W., 3,919,543.

Norris Industries, Inc.: *See—*
Harris, Frank L., 3,918,763.

North American Philips Corporation: *See—*
Lutus, Paul A., 3,919,546.
Singer, Barry M., 3,919,555.

North Star Lighting Inc.: *See—*
Castic, William A., 3,919,542.

Northcutt, Frank Eugene: *See—*
McCormack, Donald H.; and Svab, James E., 3,918,753.

Northern Electric Company Limited: *See—*
Kuhfus, Gerd, 3,919,496.
Kuhfus, Gerd, 3,919,497.

Northern Illinois Gas Company: *See—*
Simciak, Walter, 3,919,640.

Northrop Corporation: *See—*
Griffin, William Stanley, 3,918,800.
McAllister, Gary Lee, 3,919,664.

Norton, Charles J.; and Falk, David D., to Marathon Oil Company. Polyalkeneoxide and polysaccharide gum derivatives mobility control agent and process. 3,919,092, Cl. 252-8.55D.

Norton Company: *See—*
Tetzlaff, Roger W., 3,918,870.

Notestine, Richard L. Roll bar structure for vehicles. 3,918,740, Cl. 280-150.00C.

Notifier Company: *See—*
Cooper, Irving B.; Gurrieri, Joseph V.; and Lord, Michael J., 3,919,528.

Novak, John: *See—*
Stratman, Jerome F.; and Novak, John, 3,918,360.

Nowicki, Casimir W.: *See—*
Dybala, Ambrose B.; Jesiolowski, David; Nowicki, Casimir W.; and Shapler, Thomas A., 3,918,874.

NUS Corporation: *See—*
Peck, David F.; and Troy, Joseph C., 3,919,086.

Nussbaum, Otto J., to Halstead Industries, Incorporated. Heat pump with frost-free outdoor coil. 3,918,268, Cl. 62-150.000.

Nussbaumer, Thomas, to Adeola AG. Device for controlling the reciprocation of a working piston. 3,918,349, Cl. 91-5.000.

Nyholm, Bengt Viktor, to Atlas Copco Aktiebolag. Eccentric element for silencing tool and method. 3,918,530, Cl. 173-1.000.

Oak Industries Inc.: *See—*
Walding, Eugene C., 3,919,463.

Oberg, Karl Erik, to Uddeholms AB. Apparatus for refining molten metals and molten metal refining process. 3,918,692, Cl. 266-35.000.

Oberright, Edward A.: *See—*
Davis, Robert H.; Oberright, Edward A.; and Schick, John W., 3,919,093.

Oberth, Adolf F.; and Bruenner, Rolf S., to Aerojet-General Corporation. Solid propellant composition with a polyurethane binder. 3,919,011, Cl. 149-19.400.

Occidental Petroleum Corporation: *See—*
Robinson, Leon; and Bauer, Hans F., 3,919,118.

Ochs, Stefan Albert, to RCA Corporation. Target mounting structure for use in camera tube. 3,919,582, Cl. 313-383.000.

O'Connor, Bernard J.; Shaw, Richard, Jr.; and Epstein, Michael, to Bendix Corporation, The. Redundant inertial measurement system with improved failure-detection capability. 3,918,309, Cl. 74-5.340.

Odajima, Tsutou: *See—*
Matsushima, Tomoo; and Odajima, Tsutou, 3,918,959.

Oertel, Gunter: *See—*
von Gizycki, Ulrich; Oertel, Gunter; Beck, Guenther; and Findeisen, Kurt, 3,919,228.

Ogawa, Hiroshi: *See—*
Kitayama, Teruki; Takahara, Hiroaki; and Ogawa, Hiroshi, 3,918,951.

Oglivie, Frank R.; and Kalman, Peter J. Automatic machine tool. 3,918,145, Cl. 29-564.000.

Ogura, Akira: *See—*
Matsumura, Sakujiro; Yamamura, Tadashi; Ogura, Akira; and Hayashi, Masataka, 3,918,245.

Ohara, Isao: *See—*
Shimizu, Takuji; Ohara, Isao; and Yasuda, Kenji, 3,919,450.

Ohno, Akihisa: *See—*
Onoda, Takeru; Ohno, Akihisa; and Shiraga, Ken, 3,919,294.

Ohsawa, Mitsuo; and Onoe, Yukio, to Sony Corporation. AM/FM radio receiver. 3,919,645, Cl. 325-316.000.

Ohta, Wasaburo, to Ricoh Co., Ltd. Apparatus for developing an electrostatic latent image in electrophotography with a dry developing agent. 3,918,402, Cl. 118-637.000.

OJI Paper Co., Ltd.: *See—*
Shimizu, Takuji; Ohara, Isao; and Yasuda, Kenji, 3,919,450.

Oka, Shunzo: *See—*
Minami, Shunji; and Oka, Shunzo, 3,919,668.
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,919,681.

Okada, Hiroshi: *See—*
Nagayama, Masuzo; and Okada, Hiroshi, 3,919,300.

Okada, Masataka: *See—*
Nonaka, Hiroshi; Usugi, Kikuo; Okada, Masataka; and Iwasaki, Shoji, 3,918,716.

Okada, Takashi; and Utsunomiya, Kimitake, to Sony Corporation. Signal gate circuit. 3,919,567, Cl. 307-254.000.

Okamoto, Hajime, to Yashica Co., Ltd. Locking devices for doors. 3,918,750, Cl. 292-106.000.

Okamoto, Tadao; Komamura, Takeo; and Ishihama, Atsumi, to Fuji Latex Co., Ltd. Inserter for intra-uterine device (IUD). 3,918,445, Cl. 128-130.000.

Okazaki, Masaki: *See—*
Arai, Atsuaki; Okazaki, Masaki; Hibino, Noburo; and Seto, Kunihira, 3,918,976.

Oki, Masami: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.

Okorodudu, Abraham O. M., to Mobil Oil Corporation. Organic compositions containing antioxidant and antiwear additives. 3,919,095, Cl. 252-46.600.

Okubo, Hideo; and Ishikawa, Michio, to RCA Corporation. Automatic winding apparatus for a strip of material. 3,918,654, Cl. 242-56.00R.

Okuni, Tetsuo: *See—*
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.

Olin Corporation: *See—*
McLain, Charles D., 3,918,626.
Saeman, Walter C., 3,918,168.
Sawhill, Duane L., 3,919,217.
Schultes, Hermann, 3,918,730.
Scott, Robert N.; and Hooks, Haywood, Jr., 3,919,298.

Olinkraft, Inc.: *See—*
Poggiali, Lewis D., 3,918,580.

Oliver, Lloyd R., to Lloyd R. Oliver & Company. Abrading device with protrusions on metal bonded abrasive grits. 3,918,217, Cl. 51-295.000.

Olsen, Jan-Erik: *See—*
Stark, Sven Olof Soren; Olsen, Jan-Erik; and Soukup, Franz, 3,918,237.

Olson, John E.; and Gaibler, Dennis W., to Cascade Corporation. Dual mode stabilizer assembly. 3,918,741, Cl. 280-150.500.

Olson, John E.: *See—*
Gaibler, Dennis W.; and Olson, John E., 3,918,742.

Olszewski, William Frank, to Mobil Oil Corporation. Combination of benzotriazole with other materials as EP agents for lubricants. 3,919,096, Cl. 252-46.700.

Olympus Optical Co., Ltd.: *See—*
Hayamizu, Yoshisada; and Kanehira, Katsuyuki, 3,918,438.
Soya, Isao; Kimura, Katsuhiko; Nobuto, Tooru; and Nagai, Yawara, 3,918,910.

Omata, Kinji: *See—*
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, 3,919,436.

O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and by Childs, Patricia M., executrix, to Riverside Press, Inc. Voting machine. 3,919,544, Cl. 235-51.000.

Ong, Sienling; Diery, Helmut; and Weyer, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the pad-dyeing and printing of textile material of polyacrylonitrile which contains sulfonic acid groups. 3,918,900, Cl. 8-168.000.

Onishi, Kazuo: *See—*
Takahashi, Tadashi; and Onishi, Kazuo, 3,919,611.

Onitsuka Co., Ltd.: *See—*
Inohara, Masanobu, 3,918,181.

Ono, Soshiro: *See—*
Mizutani, Tadashi; and Ono, Soshiro, 3,919,026.

Onoda, Takeru; Ohno, Akihisa; and Shiraga, Ken, to Mitsubishi Chemical Industries Ltd. Process for preparing diacetoxy butane. 3,919,294, Cl. 260-491.000.

Onoe, Yukio: *See—*
Ohsawa, Mitsuo; and Onoe, Yukio, 3,919,645.

Oonishi, Kenichi: *See—*
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, 3,918,743.

Opp, Karl: *See—*
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.

Ormand, Frederick T.: *See—*
Marancik, William G.; and Ormand, Frederick T., 3,918,998.

Osada, Yukinori: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.

Osgood, John H., to Molins Machine Company, Inc. Quiet single facer machine. 3,919,029, Cl. 156-205.000.

Oshima, Hideji: *See—*
Marubashi, Kiyonobu; Oshima, Hideji; and Sakano, Yasuaki, 3,919,281.

Oshima, Kazuo: *See—*
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,919,681.

Oshima, Shintaro; Watanabe, Teruji; and Fukui, Takasuke, to Kokusai Denshin Denwa Kabushiki Kaisha. Flux detection device using a parametrically excited second harmonic oscillator. 3,919,630, Cl. 324-43.00R.

Osipyan, Armen Vartanovich. Bevel gear drive with circle-arc teeth. 3,918,314, Cl. 74-459.500.

Osterbrink, Hans: *See—*
Walburg, Richard; Gerstenberg, Helmut; and Osterbrink, Hans, 3,918,919.

Osterhout, George W. Articulated positioning device. 3,918,669, Cl. 248-206.00R.

Ostertag, Werner: *See—*
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.

Ostrovskaya, Tamara Nikolaevna: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.

O'Sullivan, Denis J.; and Bolger, Bernard J., to Loctite (Ireland) Limited. Treatment of floating pollutants. 3,919,083, Cl. 210-54.000.

Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy AG. Certain phosphorus acid esters. 3,919,129, Cl. 260-302.00E.

Oswald, Donald Buchanan; and Douglas, Melvin, to D. B. Oswald & Company Limited. Hammer board. 3,918,289, Cl. 72-439.000.

O'Toole, James T.: *See—*
Rosenthal, Rudolph; Zajacek, John G.; and O'Toole, James T., 3,919,280.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, 3,919,239.

Ott, Helmut; and Vik, Jaroslav, to Gebr. Magerle AG. Apparatus for profiling work pieces. 3,918,429, Cl. 125-11.0PH.

Overmyer, Robert C., to Hawley Manufacturing Corporation. Recoil system for furnace charger. 3,918,691, Cl. 266-16.000.

Owen, John R., to Eastman Kodak Company. Silver halide emulsions containing 8-substituted carbocyanine dyes. 3,918,978, Cl. 96-135.000.

Owens-Corning Fiberglas Corporation: *See—*
Brown, Alfred W.; and Moran, Richard J., 3,919,437.
Marzocchi, Alfred, 3,918,506.
Schroeder, Charles F., 3,919,018.

Owens-Illinois, Inc.: *See—*
Dunham, James A.; Federle, August J.; and Sorbie, Thomas B., 3,918,570.
Dybala, Ambrose B.; Jesiolowski, David; Nowicki, Casimir W.; and Shapler, Thomas A., 3,918,874.
Ernsthausen, Roger E., 3,918,136.

Hoehn, Harold J.; and Ernsthausen, Roger E., 3,919,577.
Kiel, Robert H., deceased; Kiel, Jessie H., administratrix; and Grinonneau, William C., 3,919,150.
Kontz, Robert F.; and Morrette, Richard A., 3,919,375.
Oxford Industries, Inc.: *See—*
Warnock, Emmit F.; Williamson, Bobby Wayne; Ellington, Gordon H.; and Mitchell, William O., 3,918,335.
Oxford Laboratories Inc.: *See—*
Reed, Richard D., 3,918,308.
Oxford, Richard O.: *See—*
Macho, Jan M.; and Oxford, Richard O., 3,918,733.
Oxlade, Roy Ronald: *See—*
Skelton, Charles Roger; Marshall, Joseph William; Oxlade, Roy Ronald; and Gibson, Keith Cyril, 3,918,302.
Oxley, John H.: *See—*
Rothe, Hans-Jochen; Oxley, John H.; and Terrier, Francois, 3,919,288.
Oxy-Catalyst, Incorporated: *See—*
Smithson, Harold R., 3,918,487.
Oy. Karl Fazer AB: *See—*
Hagelstam, Clas Hjalmar, 3,918,585.
Ozudogru, Yilmaz H.: *See—*
McNary, James F.; Hicks, Edward C.; and Ozudogru, Yilmaz H., 3,918,379.
Paccar Inc.: *See—*
Clavey, William F., 3,918,628.
Packard Instrument Company, Inc.: *See—*
Frank, Edmund, 3,919,554.
Packard, Norman M., to International Harvester Company. Ring manufacture, productive of line contact seal. 3,918,211, Cl. 51-157.000.
Padgett, John, Jr. Fluid operated expandable skein holder. 3,918,659, Cl. 242-110.100.
Paepke, Horst. Yarn-feeding apparatus for knitting machines. 3,918,275, Cl. 66-132.000.
Pagani, Alfred J., to Product Development I. Razor with reciprocating guard. 3,918,154, Cl. 30-34.200.
Page, Geoffrey A.: *See—*
Krohn, Ivar T.; Page, Geoffrey A.; and Tulagin, Vesvolod, 3,918,967.
Paige, John S.: *See—*
Strandine, Eldon J.; Panek, Mitchell W.; and Paige, John S., 3,918,125.
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, to Lodzkie, Zaklady Farmaceutyczne POLFA. Method of manufacturing of indolyl acetic acids. 3,919,247, Cl. 260-295.00B.
Palcic, Kenneth D., to Formulabs Industrial Inks, Incorporated. Conductor coding apparatus. 3,918,398, Cl. 118-125.000.
Palm, Bjorn Olov Magnus; Gullikson, Karl Ivar Ake; and Gustavsson, Bjorn Anders Christer, to Palm, Bjorn Olov Magnus. Apparatus for reducing the dynamic pressure of combustion air at the burner head of an oil burning appliance. 3,918,885, Cl. 431-182.000.
Palmer, Nigel Innes; Sugarman, Nathan; and Grammer, Don O'Neil, to W. R. Grace & Co. Battery separator and manufacturing process. 3,918,995, Cl. 136-145.000.
Palumbo, Luigi; and Tarozzi, Raffaele. Addition agent for molten metals and process for making the same. 3,918,963, Cl. 75-130.000.
Panek, Mitchell W.: *See—*
Strandine, Eldon J.; Panek, Mitchell W.; and Paige, John S., 3,918,125.
Pannullo, Gerard: *See—*
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerard, 3,918,307.
Papalos, John G., to Diamond Shamrock Corporation. Sulfated castor oil substitute and its use in textile treatment. 3,918,983, Cl. 106-244.000.
Parc, Guy; Born, Maurice; and Rojey, Alexandre, to Institut Francais du Petrole. Process for regenerating used lubricating oils. 3,919,075, Cl. 208-180.000.
Paris, Boris, to Societe Industrielle et Commerciale de Transformation des Plastiques"Slcopal". Juxtaposable and superposable furniture pieces. 3,918,781, Cl. 312-111.000.
Park, Kisoon, to Union Carbide Corporation. Lubricant composition. 3,919,097, Cl. 252-48.600.
Parker, Ralph L., to TRW Inc. Endless printer ribbon cartridge apparatus. 3,918,569, Cl. 197-168.000.
Parks, Harold G.; and Hughes, William C., to General Electric Company. Two-aperture immersion lens. 3,919,588, Cl. 315-14.000.
Parrish, William F.: *See—*
Spiessbach, Andrew J.; Parrish, William F.; and Kennedy, Paul G., 3,919,471.
Parshall, George W., to Du Pont de Nemours, E. I., and Company. Catalysis by dispersions of metal halides in molten trihalostannate (II) and trihalogermanate (II) salts. 3,919,271, Cl. 260-409.000.
Pasedach, Heinrich: *See—*
Himmele, Walter; Hoffmann, Werner; Pasedach, Heinrich; and Aquila, Werner, 3,919,324.
Patchell, Albert George: *See—*
Dow, James; Lloyd, Ronald; and Patchell, Albert George, 3,919,377.
Patchornik, Abraham; and Haviv, Fortuna, to Yeda Research and Development Company, Ltd. 7-(Halomethylaryl)acetamidocephalosporin derivatives. 3,919,206, Cl. 260-243.00C.
Patchornik, Abraham; and Haviv, Fortuna, to Yeda Research and Development Company, Ltd. 7-(Cyanomethylaryl)acetamidecephalosporin derivatives. 3,919,208, Cl. 260-243.00C.
Patel, Bhupendra C., to Kendall Company, The. Catheter adapter. 3,918,450, Cl. 128-247.000.
Patel, Bhupendra C., to Kendall Company, The. Catheter unit for cholangiography. 3,918,456, Cl. 128-348.000.
Patel, Girish: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,138.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,139.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,357.
Patel, Himanshu M.: *See—*
Wilcox, Harold D.; Griswold, Douglas A.; and Patel, Himanshu M., 3,919,108.
Patterson, Carol M., to Research Equipment Company, Inc. Cage apparatus. 3,918,406, Cl. 119-96.000.
Paul Forkardt Kommanditgesellschaft: *See—*
Reich, Kurt; and Blattry, Hans, 3,918,352.
Paul, Jim N. Crane hoist attachment for the bed of a truck. 3,918,592, Cl. 212-8.00R.
Paul Ritzau Pari-Werk KG: *See—*
Steil, Emeram, 3,918,451.
Pauling, Horst, to Hoffmann-La Roche Inc. Catalytic rearrangement of acetylenic carbinois to a α,β-unsaturated carbonyl compounds. 3,919,250, Cl. 260-340.900.
Pauly, Joachim W.; and Leinberry, Wilbur Stanley, to Sterer Engineering & Mfg. Co. Method and apparatus for testing leakage rate. 3,918,291, Cl. 73-40.000.
Pays, Gerard J. P.: *See—*
Person, Jean-Michel; Pays, Gerard J. P.; and Garnier, Jean-Michel A., 3,919,493.
Peart, Edward Lynn; and Martin, Billy Otis, to Sybron Corporation. Blood pressure measuring system. 3,918,436, Cl. 128-2.05G.
Pechiney-Saint-Gobain: *See—*
Vofsi, David; and Asscher, Meir, 3,919,292.
Peck, David F.; and Troy, Joseph C., to NUS Corporation. Sewage treatment apparatus. 3,919,086, Cl. 210-197.000.
Peebles, John G., Jr., to JKC Products, Inc. Disposable dental cleaning device. 3,918,466, Cl. 132-91.000.
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, to Morton-Norwich Products, Inc. Series of 5-aryl-2-furamidines. 3,919,231, Cl. 260-256.40R.
Penders, Josef M.: *See—*
Garritsen, Johan W.; and Penders, Josef M., 3,919,197.
Penfold, Alan S., to Telic Corporation. Magnetic field generation apparatus. 3,919,678, Cl. 335-296.000.
Penninger, Bill J.: *See—*
Frager, Glenn E.; and Penninger, Bill J., 3,918,529.
Pennwalt Corporation: *See—*
Huber, Ludwig Konrad, 3,919,422.
Martin, LeRoy, 3,919,171.
Yarrington, Robert Warren, 3,919,000.
Pepper, Roger Thomas; and Bucherati, Frank, to Fiber Materials, Inc. Method of producing a graphite-fiber-reinforced metal composite. 3,918,141, Cl. 29-419.00R.
Peritech International Corporation: *See—*
Bernstein, Albert, 3,918,785.
Perkins Research & Mfg. Co.: *See—*
Neail, William R.; and Rahm, Clifford A., 3,919,460.
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., to United States of America, Agriculture. Method of application of THPOH-NH_3 fire retardant finish to textiles. 3,919,439, Cl. 427-341.000.
Perl, Richard L., to Tappan Company, The. Heat system for dishwasher. 3,918,479, Cl. 137-340.000.
Perla, Giulio; and Mannara, Giuseppe, to Colgate-Palmolive Company. Novel dentifrice composition. 3,919,409, Cl. 424-52.000.
Perlhefter, Norbert: *See—*
Eichenberger, Jurg; Perlhefter, Norbert; and Bole, Pierre-Andre, 3,919,222.
Perrault, Frederick; and Perrault, Raymond E. Electrical box mounting arrangement. 3,919,458, Cl. 174-51.000.
Perrault, Raymond E.: *See—*
Perrault, Frederick; and Perrault, Raymond E., 3,919,458.
Perrett, Darcy Glen: *See—*
Evers, Roy J.; and Perrett, Darcy Glen, 3,918,124.
Perrier, Dorothy M.; and Benerito, Ruth R., to United States of America, Agriculture. Carboxymethyl (CM) cottons prepared in nonaqueous media. 3,918,899, Cl. 8-120.000.
Perry, Donald M., to Leupold & Stevens, Inc. Flat field variable power rifle scope. 3,918,791, Cl. 350-42.000
Person, Jean-Michel; Pays, Gerard J. P.; and Garnier, Jean-Michel A. Telephone ringing circuit. 3,919,493, Cl. 179-84.00R.
Peters, Shirley, to Lawrence Peska Associates, Inc., a part interest. Interlock device for skates. 3,918,729, Cl. 280-11.300.
Petersen, Kenneth C.; and Meader, Royal A., Jr., to Schenectady Chemicals, Inc. Preparation of hydrocarbon resins using zirconium tetrachloride. 3,919,181, Cl. 260-80.780.
Petersen, Niel R.; and Larson, Rodney L., to MTS Systems Corporation. Multiple actuator control system. 3,918,298, Cl. 73-71.600.
Petersen, Walter Adrian, to International Nickel Company, Inc., The. Welding material. 3,919,519, Cl. 219-137.000.
Peterson, Harold A.: *See—*
Young, Warren C.; Boom, Roger W.; and Peterson, Harold A., 3,919,677.
Peterson, Rudolph G., to Carco, Inc. Marking device for torque applying tool. 3,918,609, Cl. 222-61.000.

Petrikas, Aloyzas: *See—*
Ettre, Kitty S.; Castles, George Richard; and Petrikas, Aloyzas, 3,919,452.

Pettitt, David J.: *See—*
Empey, Richard A.; and Pettitt, David J., 3,919,189.

Peugeot, Richard S., to Ridge Instrument Company, Inc. X-ray baggage inspection system. 3,919,467, Cl. 178-6.800.

Pfeiffer, Hans: *See—*
Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, 3,919,045.

Pfizer Inc.: *See—*
McFarland, James W., 3,919,224.

Pfundstein, Wolfgang: *See—*
Jablonsky, Erich; Pfundstein, Wolfgang; and Elser, Dieter, 3,918,544.

Pharriss, Bruce B.: *See—*
Hoff, Seymour; Kehr, Sharon A.; and Pharriss, Bruce B., 3,918,444.

Phelps Dodge Industries, Inc.: *See—*
Carlsson, Sven A., 3,918,223.

Philadelphia Quartz Company: *See—*
Pierce, Richard H., 3,918,921.

Phillips, Bernard L., to Arrow-Hart, Inc. Clamping mechanism for bolted contact switch. 3,919,513, Cl. 200-256.000.

Phillips Petroleum Company: *See—*
Campbell, Robert W., 3,919,177.
Chapman, Charles C., 3,919,342.
Johnson, Paul H., 3,918,914.
Pitchford, Armin C.; and Woodruff, Gene N., 3,919,072.
Schiff, Sidney, 3,919,094.
Wells, Johnny L., 3,918,927.

Phillips, Ronald, to C.A.V. Limited. Actuator mechanism. 3,918,318, Cl. 74-479.000.

Phillipson, Alan; Spiller, Basil Harry Royston; Newman, Cyril Leslie; and Smith, Robin, to Decca Limited. Record making press. 3,918,875, Cl. 425-384.000.

Phipard, Harvey F., Jr., to Research Engineering & Manufacturing, Inc. Thread forming fasteners. 3,918,345, Cl. 85-46.000.

Piccino, Pierre-Michel; and Ringrose, Anthony Stephen, to Stern Freres SA. Mist generator. 3,918,640, Cl. 239-4.000.

Pichnej, Lidia: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.

Pickard, Bernard H., to Bardon Research and Development Limited. Engine preheater. 3,919,520, Cl. 219-208.000.

Pickett, William H., to Plasticrete Corporation. Concrete block mold with parallel linkage means. 3,918,877, Cl. 425-443.00υ.

Pickles, Wilfred: *See—*
Randell, Donald Richard; and Pickles, Wilfred, 3,919,158.

Pieper, Heinrich: *See—*
Graff, Klaus; and Pieper, Heinrich, 3,919,639.

Pierce, Richard H., to Philadelphia Quartz Company. Process for making granular hydrated alkali metal silicate. 3,918,921, Cl. 23-313.0AS.

Pierre, Bernard; Volle, Rene; and Simon, Georges, to Etat Francais. Automatic firearms with mechanical servo-release mechanism. 3,918,347, Cl. 89-141.000.

Pigerol, Charles: *See—*
Carraz, Gilbert; Pigerol, Charles; Jean-Grandremy, Alain; and Eymard, Pierre Luc, 3,919,229.

Pike, John E.; and Schneider, William P., to Upjohn Company, The. PGE_2, 15-acetate, methyl ester. 3,919,293, Cl. 260-488.00R.

Pike, John E.: *See—*
Bundy, Gordon L.; and Pike, John E., 3,919,286.

Pilot Research & Development Co.: *See—*
Cutler, Louis E.; and Cutler, Edward T., 3,919,076.

Pirman, Robert L.: *See—*
Jacobson, Peter E.; and Pirman, Robert L., 3,918,778.

Pistor, Michel Louis Paul, to Etablissements A. Guerin; and Pistor, Michel, Louis, Paul. Device for cutaneous therapeutic treatment. 3,918,449, Cl. 128-218.00R.

Pistor, Michel, Louis, Paul: *See—*
Pistor, Michel Louis Paul, 3,918,449.

Pitchford, Armin C.; and Woodruff, Gene N., to Phillips Petroleum Company. Resins from high boiling hydrocarbons and asphalts containing the same. 3,919,072, Cl. 208-4.000.

Pitney-Bowes, Inc.: *See—*
Montagnino, James G., 3,918,313.
Zweig, Gilbert, 3,918,971.

Plante, Lucille I. Surgical washing device. 3,918,117, Cl. 15-21.00D.

Plasticrete Corporation: *See—*
Pickett, William H., 3,918,877.

Platt, Clark I.; and Czech, James I., to Whirlpool Corporation. Invertible dual action spray arm for dishwasher. 3,918,644, Cl. 239-243.000.

Plattner, Eric; Comninellis, Christos; and Javet, Philippe, to Ciba-Geigy AG. Process for the electrochemical fluorination of organic acid halides. 3,919,057, Cl. 204-59.00F.

Ploger, Walter: *See—*
Schindler, Norbert; and Ploger, Walter, 3,919,296.

Plourde, James Kevin, to Bell Telephone Laboratories, Incorporated. Temperature compensated dielectric resonators. 3,919,672, Cl. 333-82.0BT.

Plunkett, Allan B.: *See—*
McMurray, William; Plunkett, Allan B.; and Stitt, Thomas D., 3,919,620.

Pneumatic Scale Corporation: *See—*
Trusselle, William H., 3,918,475.

Poe, L. Richard, to Hartwell Corporation. Initially one piece removable fastener. 3,918,130, Cl. 24-73.00P.

Pogge, H. Bernhard; and Poponiak, Michael R., to International Business Machines Corporation. Method of fabricating semiconductor device embodying dielectric isolation. 3,919,060, Cl. 204-129.300.

Poggiali, Lewis D., to Olinkraft, Inc. End cap. 3,918,580, Cl. 206-320.000.

Pohl, Hans: *See—*
Lamprecht, Adolf; and Pohl, Hans, 3,918,887.

Polaroid Corporation: *See—*
Luhowy, Roberta R.; and Meneghini, Frank A., 3,919,277.

Polese, Joseph T.: *See—*
Leone, Adolph A.; Polese, Joseph T.; and Polese, Richard, 3,918,752.

Polese, Richard: *See—*
Leone, Adolph A.; Polese, Joseph T.; and Polese, Richard, 3,918,752.

Pollex, Robert C.: *See—*
Bobel, Robert J., II; Kimura, Robert B.; and Pollex, Robert C., 3,919,531.

Pollitzer, Ernest L.: *See—*
Germanas, Dalia; and Pollitzer, Ernest L., 3,919,341.

Polva Nederland B.V.: *See—*
Acda, Petrus Marinus, 3,918,748.

Polyakov, Valentin Alexandrovich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.

Polygram GmbH: *See—*
Burkowitz, Peter Klaus, 3,919,477.

Polytex A.G.: *See—*
Rohner, Hans, 3,919,039.

Pommers, Ansis; and Lotz, Robert W., to Singer Company, The. Sample rate coordinator and data handling system. 3,919,526, Cl. 235-61.60A.

Ponomarenko, Vladimir Ivanovich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Poole, Dennis Frederick: *See—*
Hawker, Michael John; and Poole, Dennis Frederick, 3,918,657.

Poponiak, Michael R.: *See—*
Pogge, H. Bernhard; and Poponiak, Michael R., 3,919,060.

Popova, Nataliya Alexandrovna: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.

Porter, David E. X-Ray energy spectrometer system. 3,919,548, Cl. 250-277.000.

Porter, James A. Safety and security device. 3,918,599, Cl. 214-454.000.

Porter, Samuel, Jr.: *See—*
Chang, Wen-Hsuan; Erikson, J. Alden; and Porter, Samuel, Jr., 3,919,351.

Porter, William H., to W. H. Porter, Inc. Construction panel having overlapping edges and foam backing. 3,919,443, Cl. 428-81.000.

Posgate, Edward S., to Wacan Hydro-Flow Ltd. Turbidimeters. 3,918,817, Cl. 356-208.000.

Poslinska, Halina: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.

Posner, Ronald Sheldon; and Walker, Richard Marion, to Microwave Associates, Inc. Solid state microwave cavity oscillator operating below cavity cutoff frequency. 3,919,666, Cl. 331-96.000.

Postma, Norman D., to Ford Motor Company. Hot exhaust gas recirculating system for a stirling engine. 3,918,262, Cl. 60-517.000.

Potel, Jurgen: *See—*
Rebling, Rolf; Pressler, Klaus; and Potel, Jurgen, 3,919,233.

Potts, James E.: *See—*
Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., 3,919,163.

Poucher, Michael; and Brooking, Ivor Harold, to Dowty Rotol Limited. Bladed rotors. 3,918,837, Cl. 416-157.000.

Poulos, George. Rotating display constructions. 3,918,183, Cl. 40-33.000.

Pounhet, Pierre: *See—*
Carrasse, Jean; Gerard, Jacques; Pounhet, Pierre; and Martin, Therese, 3,918,516.

Powell, David Barton: *See—*
Acampora, Vincent Paul; and Powell, David Barton, 3,919,674.

Powers, Edward F., Jr.: *See—*
Denzer, Alan R.; and Powers, Edward F., Jr., 3,918,735.
Pozniko, John: *See—*
Deeter, Ronald C.; and Pozniko, John, 3,918,536.
PPG Industries, Inc.: *See—*
Bowser, George H.; and Mazzoni, Renato J., 3,919,023.
Chang, Wen-Hsuan; Erikson, J. Alden; and Porter, Samuel, Jr., 3,919,351.
Drummond, Warren W., 3,918,244.
Hahn, Ernest A., 3,918,393.
Holloway, John G.; and Barch, Herbert W., 3,918,936.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,937.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,943.
Holloway, John G.; and Barch, Herbert W., 3,918,945.
Krupp, Myron J.; Colburn, Fred R.; and Knudtson, John P., 3,919,152.
Maaghul, John; and Griffiths, David H., 3,918,947.
Monzi, Tulio J., 3,918,948.
Raetzsch, Carl W.; Darlington, William B.; and Cunningham, Hugh, 3,919,059.
Schwenninger, Ronald L., 3,918,949.
Stefanik, John E., 3,919,022.
Stilley, George W., 3,918,950.
Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,944.
Prager, Barry H. Motorcycle throttle-grip protector. 3,918,323, Cl. 74-551.800.
Precise AG Rechenmaschinenfabrik: *See—*
Meier, Johann, 3,918,771.
Pressler, Klaus: *See—*
Rebling, Rolf; Pressler, Klaus; and Potel, Jurgen, 3,919,233.
Priaroggia, Paolo Gazzana, to Industrie Pirelli S.p.A. Method for sheathing a cable core with the core surrounded by impregnating fluid during sheathing. 3,918,281, Cl. 72-38.000.
Price, Byron H.: *See—*
Clark, Virgil R.; Goodew, Carroll D.; Kueper, Terrance W.; and Price, Byron H., 3,919,565.
Prinzing, Robert: *See—*
Lehmann, Ernst; and Prinzing, Robert, 3,918,641.
Privitera, Francesco. Bowling ball propelling mechanism. 3,918,426, Cl. 124-16.000.
Procter & Gamble Company, The: *See—*
Thompson, James Edwin, 3,919,107.
Product Development I: *See—*
Pagani, Alfred J., 3,918,154.
Profile Expanded Plastics Limited: *See—*
Cotterell, Robert Frederick Joseph, 3,919,370.
Prokesch, Albin, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Nonskid protective device for resilient wheels. 3,918,504, Cl. 152-225.000.
Promecam-Sisson-Lehmann: *See—*
Cailloux, Paul, 3,918,339.
Przepalkowski, Adam: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.
Ptaszynski, Leszek: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.
Pudsey, David Graham, to Elliott Brothers (London) Limited. Ranging systems. 3,919,708, Cl. 343-6.50R.
Puglis, George S. Board game apparatus. 3,918,715, Cl. 273-131.0AB.
Pullen, Joseph B.; and Mobley, Burton L., to W. R. Grace & Co. Method for the production of alpha alumina monohydrate. 3,919,403, Cl. 423-628.000.
Pulzer, Jean-Bernard, to Setco la Chaux-de-Fonds S.A. Electronic device serving to supply a load with constant voltage pulses. 3,918,425, Cl. 123-148.00E.
Purdue Research Foundation: *See—*
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,678.
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, 3,918,942.
Purification Sciences Inc.: *See—*
Lowther, Frank Eugene, 3,919,064.
Pusschert, Walter Alfred: *See—*
Horster, Horst; Pusschert, Walter Alfred; Schweppe, Heinz; and Czarnojan, Wolfram, 3,919,570.
Putch, Samuel W., to Nelson, Norman A., a part interest. Well suspension system. 3,918,747, Cl. 285-4.000.
Pyles, Manuel A., to Utilco Company, The. Multiplex electrical conductor spreader. 3,918,684, Cl. 254-131.000.
Quattrociocchi, Eugene J., to Schenectady Chemicals, Inc. Asbestos substitute. 3,919,141, Cl. 260-17.200.
Queen Manufacturing Co., Inc.: *See—*
Doherty, Donald W., 3,918,670.
R. L. Kuss & Co., Inc.: *See—*
Benjamin, Gary L., 3,918,221.
Rabideau, Phillip A. Jig-spinner fish lure. 3,918,192, Cl. 43-42.170.
Rabone Chesterman Limited: *See—*
Hawker, Michael John; and Poole, Dennis Frederick, 3,918,657.
Racenis, Karlis V., to McGraw-Edison Company. Water level control for washing machines. 3,918,457, Cl. 137-387.000.
Radak, William J.: *See—*
Young, Richard A.; and Radak, William J., 3,919,349.
Radscheit, Kurt: *See—*
Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, 3,919,191.
Raetzsch, Carl W.; Darlington, William B.; and Cunningham, Hugh, to PPG Industries, Inc. Electrolytic cell. 3,919,059, Cl. 204-129.000.
Raff, Ronald D.: *See—*
Morgan, Ward; Weiner, Gerald H.; and Raff, Ronald D., 3,918,161.
Rahm, Clifford A.: *See—*
Neail, William R.; and Rahm, Clifford A., 3,919,460.
Raidel, John E. Vehicle suspension assembly with torque plate. 3,918,738, Cl. 280-124.00R.
Raimar Pohlman: *See—*
Herbertz, Joachim, 3,918,295.
Rainville Company, Inc.: *See—*
Eichenberger, Walter; Mulraney, David; and Reese, Melton E., 3,918,866.
Rakshys, Joseph W., Jr.; and McKinley, Suzanne V., to Dow Chemical Company, The. Insoluble polyalkyl phosphonium salt resins having crosslinked backbone. 3,919,126, Cl. 260-2.10E.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Certain dioxopiprazinyl-alkyl-phenols. 3,919,234, Cl. 260-268.0TR.
Ramsey, David W.; and Jayroe, Charles H., to Dow Chemical Company, The. Continuous process for the production of solid epoxy resins. 3,919,169, Cl. 260-47.0EP.
Ramsey, Henry R., to Webster Spring Co. Inc. Coil transfer apparatus. 3,918,473, Cl. 140-3.0CA.
Randell, Donald Richard; and Pickles, Wilfred, to Ciba-Geigy AG. Polyvinyl chloride plasticized with mixed phosphate esters. 3,919,158, Cl. 260-30.60R.
Rando Machine Corporation: *See—*
Wood, Dennis E., 3,918,126.
Rangel-Garza, Javier: *See—*
Leal-Diaz, Jaime; and Rangel-Garza, Javier, 3,918,646.
Rank Xerox Ltd.: *See—*
Honda, Ko, 3,919,605.
Rankowitz, Marshall M.: *See—*
Feldbrugge, Alonzo H. R.; Rankowitz, Marshall M.; and Huste, Arno, 3,919,435.
Ranks Hovis McDougall Limited: *See—*
Barker, Sidney Alan; and Kennedy, John Frederick, 3,919,190.
Ransburg Electro-Coating Corporation: *See—*
Spiller, Lester L., 3,919,042.
Ransley, Derek L., to Chevron Research Company. Hydrogenolysis/isomerization process. 3,919,339, Cl. 260-672.00R.
Ransomes Sims & Jefferies Limited: *See—*
Aldred, Edward John; and Kowalski, Julian, 3,918,239.
Rasmussen, Villum Benedikt Kann. Window, particularly for being mounted in an inclined roof. 3,918,205, Cl. 49-252.000.
Rath, Heinrich Bernhard, to Girling Limited. Apparatus for locating a friction pad assembly to a support member. 3,918,555, Cl. 188-73.500.
Ratnam, Devineni V., to Crucible Inc. Sintered rare-earth cobalt magnets comprising mischmetal plus cerium-free mischmetal. 3,919,001, Cl. 148-31.570.
Ratzel, Rudiger; and Steinmann, Helmut, to Robert Bosch G.m.b.H. Interval windshield wiper arrangement. 3,919,612, Cl. 318-.2G..
Rauschenberger, Gunter. Adjustable joint. 3,918,822, Cl. 403-62.000.
Ray, Dick, deceased; and Stevens, Gene R. Spring actuated electric switch with particular latching dog arrangement. 3,919,512, Cl. 200-153.0SC.
Ray, Robert L., to Dayco Corporation. Endless power transmission belt and method of making same. 3,919,025, Cl. 156-141.000.
RCA Corporation: *See—*
Bingham, Joseph Peter, 3,919,714.
Dorsey, Denis Peter; Rodda, William E.; and Filson, Ralph Stuart, 3,919,472.
Gadbois, George Simon, 3,918,815.
Hanak, Joseph John, 3,919,589.
Hart, Lewis Frederick; and Buttle, Robert Leroy, 3,918,982.
Logemann, Hugo, Jr., 3,919,649.
Maxemchuk, Nicholas Frank, 3,919,484.
Naidus, Edward Sidney, 3,918,226.
Ochs, Stefan Albert, 3,919,582.
Okubo, Hideo; and Ishikawa, Michio, 3,918,654.
Weimer, Paul Kessler, 3,919,468.
Reardon, Robert C., Jr.: *See—*
Gutierrez, Eddie N.; and Reardon, Robert C., Jr., 3,919,328.
Rebling, Rolf; Pressler, Klaus; and Potel, Jurgen, to Asta-Werke Aktiengesellschaft Chemische Fabrik. Cyclic urea derivatives and salts thereof. 3,919,233, Cl. 260-268.00C.
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, to Purdue Research Foundation. Aseptic bulk material storage system and improved aseptic valve therefor. 3,918,678, Cl. 251-144.000.
Rechtsteiner, Steve A.; Nelson, Philip E.; and deBonte, Marinus, to Purdue Research Foundation. Aseptic storage system for bulk materials and improved microbiological filter therefor. 3,918,942, Cl. 55-385.000.
Redeker, Joerg: *See—*
Schuhmacher, Alfred; Hiller, Heinrich; and Redeker, Joerg, 3,919,303.
Redyref-Pressed & Welded, Inc.: *See—*
Torn, Lawrence J.; and Cammarota, David F., 3,918,672.

Reed, Dale H., to Atlantic Richfield Company. Underwater seismic source and method. 3,919,684, Cl. 340-8.00R.

Reed, Richard D., to Oxford Laboratories Inc. Liquid transfer pipetting device with a tip ejector. 3,918,308, Cl. 73-425.600.

Rees, John Michael: *See—*
Coaton, James Richard; and Rees, John Michael, 3,919,578.

Reese, Melton E.: *See—*
Eichenberger, Walter; Mulraney, David; and Reese, Melton E., 3,918,866.

Refacciones Plasticas y Metalicas, S.A.: *See—*
Gonzalez, Guillermo Gonzalez, 3,919,089.

Reh, Klaus; and Schulz, Peter, to International Standard Electric Corporation. Horizontal deflection circuit for television receivers. 3,919,599, Cl. 315-387.000.

Reich, Andrew, to Intertechnique S.A. Method and apparatus for preparation of liquid samples. 3,918,911, Cl. 23-253.0PC.

Reich, Kurt; and Blattry, Hans, to Paul Forkardt Kommanditgesellschaft. Device for feeding a pressure medium to a rotating double acting pressure cylinder for actuating clamping tools. 3,918,352, Cl. 92-106.000.

Reid, James B., to Westinghouse Electric Corporation. Digital nuclear reactor control rod position indiction system. 3,919,043, Cl. 176-19.00R.

Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., to Youngstown Sheet and Tube Company. Seamless tube mill piercer mandrel and assembly. 3,918,284, Cl. 72-97.000.

Reinbeck, Hans; Stracke, Karl-Hubert; and Collmer, Alfred, to Robert Bosch G.m.b.H. Electric D-C vehicle motor. 3,919,576, Cl. 310-207.000.

Reinecke, Erich, to WABCO Westinghouse G.m.b.H. Antiskid vehicle brake system for individual wheel control including a fluid pressure comparator device. 3,918,767, Cl. 303-21.00A.

Reinhardt, Robert M.: *See—*
Kullman, Russel M.; and Reinhardt, Robert M., 3,918,903.

Reinhart, Fred; and Bolton, Edwin C., to Dolco Packaging Corporation. Interchangeable print and label insertion apparatus for conveyor system. 3,919,036, Cl. 156-384.000.

Reinhold, Norbert; and Berg, Horst, to Volkswagenwerk Aktiengesellschaft. Gear shift arrangement. 3,918,316, Cl. 74-473.00P.

Reinshagen, Hellmuth: *See—*
Egger, Helmut; and Reinshagen, Hellmuth, 3,919,290.

Reinthaler, Karl: *See—*
Cech, Karl; and Reinthaler, Karl, 3,919,501.

Reliance Instrument Manufacturing Corporation: *See—*
Hayes, William H.; and McConnell, David P., 3,919,702.

Remery, Michel; and Souvay, Andre, to U.S. Philips Corporation. Arrangement for igniting a gas and/or vapour discharge lamp provided with preheatable electrodes. 3,919,590, Cl. 315-101.000.

Republic of France, The: *See—*
Arribat, Paul, 3,918,365.

Republic Steel Corporation: *See—*
Mandula, Joseph M.; Baraona, John P.; and Mates, Chester J., 3,919,628.

Research Corporation: *See—*
Cohen, Arthur L.; Garner, Gerald E.; and Steever, Raymond G. E., Jr., 3,919,553.
Collins, Kim D., 3,919,360.

Research Engineering & Manufacturing, Inc.: *See—*
Phipard, Harvey F., Jr., 3,918,345.

Research Equipment Company, Inc.: *See—*
Patterson, Carol M., 3,918,406.

Restaurant Technology, Inc.: *See—*
Gilomen, Jerry L., 3,918,635.

Reuther, John F., to Westinghouse Electric Corporation. Industrial gas turbine power plant control system having capability for effectuating automatic fuel transfer under load preferably employing a digital computer. 3,919,623, Cl. 322-15.000.

Rexroth GmbH: *See—*
Bornholdt, Siegfried, 3,918,855.

Reynolds, Blake, to Texaco Development Corporation. Oxo-synthesis gas. 3,919,113, Cl. 252-373.000.

Reynolds, Blake, to Texaco Development Corporation. Synthesis gas process. 3,919,114, Cl. 252-373.000.

Rhein, Robert A.; and Ingham, John D., to California Institute of Technology. Method of preparing polyesters from polymeric polyols and dianhydrides. 3,919,172, Cl. 260-75.00R.

Rheinmetall G.m.b.H.: *See—*
Grosswendt, Werner, 3,918,664.

Rhodes, Richard D., Jr., to McCord Corporation. One step dual foam crash pad mold assembly. 3,918,863, Cl. 425-117.000.

Rhone-Poulenc S.A.: *See—*
Gay, Michel, 3,919,305.
Janin, Raymond; and Krumenacker, Leon, 3,919,263.

Rhone-Poulenc-Textile: *See—*
Allard, Pierre, 3,919,170.

Ricci, Louis N.: *See—*
Salvati, John G.; Ricci, Louis N.; and Clark, Thomas E., 3,919,603.

Rice, Warren A., to Chemotronics International, Inc. Apparatus and method of ignition for combustible gases. 3,918,878, Cl. 431-6.000.

Richardson, Larry A., to Kellogg Company. Shipping case for cartons or containers. 3,918,584, Cl. 206-497.000.

Richardson, Norman; Jones, Thomas Ivor; and Miles, Peter, to Ciba-Geigy (UK) Limited. Improved process for making polymaleic anhydride. 3,919,258, Cl. 260-346.80R.

Ricoh Co., Ltd.: *See—*
Kondoh, Mitsuru, 3,919,464.
Mano, Hiroshi; and Yamada, Hiroshi, 3,918,703.
Narita, Teruo, 3,918,808.
Ohta, Wasaburo, 3,918,402.
Shiina, Toshio, 3,918,515.

Ridge Instrument Company, Inc.: *See—*
Peugeot, Richard S., 3,919,467.

Riesner, Walter: *See—*
Fischer, Wilhelm; Kraush, Friedrich; Riesner, Walter; and Sonnenmoser, Hubert, 3,918,356.

Riken Piston Ring Industrial Co., Ltd.: *See—*
Inoue, Hiroshi, 3,918,923.

Riken Piston Ring Kogyo Kabushiki Kaisha: *See—*
Suzuki, Kenzo; Mizobuchi, Toshio; and Kase, Makoto, 3,918,957.

Riley, Colleen. Educational puzzle. 3,918,178, Cl. 35-31.00G.

Riley, Jesse Louis; and White, Howard Ray, Jr., to Celanese Corporation. Dry spun pentagrooved filaments. 3,918,247, Cl. 57-140.00J.

Ringrose, Anthony Stephen: *See—*
Piccino, Pierre-Michel; and Ringrose, Anthony Stephen, 3,918,640.

Risse, Roger Paul Pierre, to Societe Lyonnaise des Applications Catalytiques. Safety device for gas-consuming equipment. 3,918,880, Cl. 431-22.000.

Riverside Press, Inc.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; Childs, George William, deceased; and Childs, Patricia M., executrix, 3,919,544.

Rizo-Patron, Alfonso. Speaker system. 3,918,551, Cl. 181-144.000.

Robert Bosch G.m.b.H.: *See—*
Espenschied, Helmut; Rothfuss, Georg; and Smentek, Hans-Dietrich, 3,918,312.
Kaiser, Anton; Keller, Helmut; and Kugelmann, Adolf, 3,919,602.
Kerner, Karl, 3,919,525.
Ratzel, Rudiger; and Steinmann, Helmut, 3,919,612.
Reinbeck, Hans; Stracke, Karl-Hubert; and Collmer, Alfred, 3,919,576.
Steinmann, Helmut, 3,919,613.
Weber, Johannes; and Schneider, Wolfgang, 3,919,575.

Roberts, Gary, to Intel Corporation. Al/Si metallization process. 3,918,149, Cl. 29-580.000.

Robertson Paper Box Co., Inc.: *See—*
Hackenberg, Robert A., 3,918,631.

Robilliart, Michel: *See—*
Ardry, Robert; and Robilliart, Michel, 3,919,186.

Robins, Roland K.: *See—*
Mian, Abdul M.; and Robins, Roland K., 3,919,193.

Robinson, Leon; and Bauer, Hans F., to Occidental Petroleum Corporation. Process for desulfurizing char. 3,919,118, Cl. 423-461.000.

Rocco, William A.: *See—*
Wentorf, Robert H., Jr.; and Rocco, William A., 3,918,219.

Rocha, Henry A. F., to General Electric Company. Acoustic imaging apparatus with gray scale display. 3,918,297, Cl. 73-67.700.

Rockwell International Corporation: *See—*
Grimm, Donald K.; and Totten, Floyd M., 3,919,706.

Rodda, William E.: *See—*
Dorsey, Denis Peter; Rodda, William E.; and Filson, Ralph Stuart, 3,919,472.

Rodionov, Jury Alexandrovich: *See—*
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.

Roerty, Dennis F., to Westinghouse Electric Corporation. Fluid damping system for analog instruments. 3,919,632, Cl. 324-125.000.

Roesch, Androniki: *See—*
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,919,226.

Roesch, Egon: *See—*
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,919,226.

Roesky, Herbert Walter; Niederprum, Hans; and Wechsberg, Manfred, to Bayer Aktiengesellschaft. Perfluoroalkyl sulphinic acids and a process for their production. 3,919,301, Cl. 260-513.700.

Rogers, Joan H.: *See—*
Dunbar, Joseph E.; and Rogers, Joan H., 3,919,212.

Rogler, Walter: *See—*
Lenz, Arnold; and Rogler, Walter, 3,919,405.

Rohe, Hermann: *See—*
Schabacher, Werner; Rohe, Hermann; Keller, Wolfgang; and Spreckelmeyer, Bernhard, 3,919,399.

Rohm & Haas Company: *See—*
Emmons, William D., 3,919,146.
Levy, Jerome F.; Alps, Hugo A.; Alderman, Michael L.; and Templer, David A., 3,919,451.
White, Michael L., 3,919,031.

Rohner, Hans, to Polytex A.G. Apparatus for making swatch cards. 3,919,039, Cl. 156-562.000.

Rohr, Wolfgang: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,919,282.

Rojey, Alexandre: *See—*
Parc, Guy; Born, Maurice; and Rojey, Alexandre, 3,919,075.

Rolinson, George Newbolt: *See—*
Butterworth, Denis; and Rolinson, George Newbolt, 3,919,415.

Rollins, Dallas W.: *See—*
Campbell, George C.; Hammonds, James C.; and Rollins, Dallas W., 3,918,370.

Rolls-Royce (1971) Limited: *See—*
Haworth, Lional; Foweraker, David Bruce; and Foster, Richard Armstrong, 3,918,840.
Longley, Peter John; and Gale, Anthony George, 3,918,842.
Rolston, Charles E.: *See—*
Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., 3,919,696.
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, to British Steel Corporation (Chemicals) Limited. Attrition-resistant titanium catalyst carrier and method of making same. 3,919,119, Cl. 252-461.000.
Romell, Gunnar Vigg Riss: *See—*
Eklof, Ake Torsten; and Romell, Gunnar Vigg Riss, 3,918,535.
Rork, Gerald D.: *See—*
Koch, Robert B.; Nelson, Leroy D.; and Rork, Gerald D., 3,919,051.
Rose, Peter, to Heidenreich & Harbeck Zweingniederlassung der Gildemeister AG. Apparatus for blow-moulding hollow bodies. 3,918,876, Cl. 425-389.000.
Rosenthal, Rudolph; and Zajacek, John G., to Atlantic Richfield Company. Production of isocyanates from lower alkyl esters of mononuclear aromatic carbamic acids. 3,919,278, Cl. 260-453.00P.
Rosenthal, Rudolph; and Zajacek, John G., to Atlantic Richfield Company. Catalytic production of isocyanates from esters of carbamic acids. 3,919,279, Cl. 260-453.00P.
Rosenthal, Rudolph; Zajacek, John G.; and O'Toole, James T., to Atlantic Richfield Company. Recovery of solvents employed in the production of isocyanates from esters of carbamic acids. 3,919,280, Cl. 260-453.00P.
Roshon, David D., Jr.: *See—*
Cullen, Francis M.; Roshon, David D., Jr.; and Snyder, Keith A., 3,919,717.
Ross, Donald R., Sr., to U-S Safety Trolley Corporation. Trolley electrical collector. 3,918,557, Cl. 191-59.100.
Ross, John S. H., to BBC Brown Boveri & Company Limited. Bearing for the rotor of a dynamo-electric machine provided with a superconducting winding. 3,919,571, Cl. 310-40.000.
Ross, Sidney D.: *See—*
Alwitt, Robert S.; and Ross, Sidney D., 3,919,604.
Rossi, Alberto, to Ciba-Geigy Corporation. β-Hydroxy-β-(cycloalkenylphenyl)alkanoic acids, esters and salts. 3,919,304, Cl. 260-520.000.
Rossiter, Michael Weston, to Commonwealth of Australia, The. Optical collimating alignment units. 3,918,813, Cl. 356-153.000.
Roth, Herbert R.: *See—*
Comer, William T.; and Roth, Herbert R., 3,919,424.
Rothe, Hans-Jochen; Oxley, John H.; and Terrier, Francois, to Zimmer Aktiengesellschaft. Method for discontinuous ester interchange of esters of dicarboxylic acids with aliphatic diols. 3,919,288, Cl. 260-475.00P.
Rothfuss, Georg: *See—*
Espenschied, Helmut; Rothfuss, Georg; and Smentek, Hans-Dietrich, 3,918,312.
Rothman, Edward S.; and Moore, Gordon G., to United States of America, Agriculture. Chelated beta dicarbonyl compounds. 3,919,275, Cl. 260-438.100.
Rotron, Incorporated: *See—*
Desy, Jacques J., 3,919,572.
Rouch, Keith E., to Allis-Chalmers Corporation. Pivoted bearing pad apparatus and restraining arrangement therefor. 3,918,770, Cl. 308-2.00R.
Roussel-UCLAF: *See—*
Grandadam, Jean Andre, 3,919,420.
Warnant, Julien; and Jolly, Jean, 3,919,198.
Warnant, Julien; and Jolly, Jean, 3,919,267.
Rousset, Louis. Camming mechanism for a brake or clutch device. 3,918,559, Cl. 192-54.000.
Rouverol, William S. High capacity gearing. 3,918,315, Cl. 74-462.000.
Rowenta-Werke, GmbH: *See—*
Lamprecht, Adolf; and Pohl, Hans, 3,918,887.
Rowlette, John J., to Erway, Duane D., a part interest. Chemical dispensing system. 3,918,607, Cl. 221-15.000.
Roy, Kenneth Lee: *See—*
Hadfield, Raymond George; and Roy, Kenneth Lee, 3,918,391.
Rubber Dynamics Corporation: *See—*
Jones, Walter C., 3,919,027.
Jones, Walter C., 3,919,030.
Rubin, Howard: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,138.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,139.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,357.
Rufenacht, Kurt: *See—*
Kristinsson, Haukur; and Rufenacht, Kurt, 3,919,244.
Runft, Rudi K., to Cross Company, The. Adaptive control system. 3,918,348, Cl. 90-11.00R.
Runninger, Frederick L., to Dunham-Bush, Inc. Secondary air control arrangement for fuel oil burner. 3,918,886, Cl. 431-184.000.
Rupp, Michael: *See—*
Honold, Ernst; and Rupp, Michael, 3,918,272.
Rusinovskaya, Irina Ivanovna: *See—*
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.
Ryton Machine Tools (Coventry) Limited: *See—*
Jury, Kenneth James; and Mottram, Brian John, 3,918,220.
S.E.C.I. Soc. Elettrotecnica Chimica Italiana S.p.A.: *See—*
Costa, Ubaldo, 3,919,682.
Saba, Joseph M., to Technical Resources, Inc. Valve. 3,918,437, Cl. 128-2.05G.
Saeman, Walter C., to Olin Corporation. Method for drying adherent particulate matter such as a polyvinyl chloride resin. 3,918,168, Cl. 34-11.000.
Sahores, Jean; and Larribau, Etienne, to Societe Nationale des Petroles d'Aquitaine. Portable X-ray spectrometer. 3,919,549, Cl. 250-310.000.
St. Barnabas Free Home: *See—*
Hopkinson, Paul O. W., 3,918,329.
Saito, Shiro: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.
Saito, Toseki: *See—*
Sato, Hiroki; Saito, Toseki; Hirano, Koji; and Takahashi, Hiroh, 3,919,587.
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Motion picture camera which can use different kinds of film cartridges containing different length of film. 3,918,802, Cl. 352-72.000.
Sakai, Siro: *See—*
Hirata, Hidekazu; and Sakai, Siro, 3,919,140.
Sakano, Yasuaki: *See—*
Marubashi, Kiyonobu; Oshima, Hideji; and Sakano, Yasuaki, 3,919,281.
Sakata, Gojyo: *See—*
Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, 3,919,363.
Sakurai, Toshio: *See—*
Ide, Fumio; Kishida, Kazuo; Sakurai, Toshio; and Kawakami, Syoichi, 3,919,157.
Salem Tool Company, The: *See—*
Deeter, Ronald C.; and Pozniko, John, 3,918,536.
Saltzman, William H., to Intellectual Property Development Corporation. Production of bile acids. 3,919,266, Cl. 260-397.100.
Salvati, John G.; Ricci, Louis N.; and Clark, Thomas E., to Westinghouse Electric Corporation. Switchboard framework corner tie. 3,919,603, Cl. 317-121.000.
Sam, Donnie Joe; and Wuonola, Mark A., to Du Pont de Nemours, E. I., and Company. Imidazoquinoxaline fungicides. 3,919,423, Cl. 424-250.000.
Samizo, Hiroshi, to Iwatsu Electric Co., Ltd. Deflection blanking circuit for use in a cathode ray oscilloscope. 3,919,598, Cl. 315-385.000.
Sammons, Herbert F.: *See—*
Lindsey, L. E.; and Sammons, Herbert F., 3,918,685.
Samour, Carlos M.: *See—*
Vida, Julius A.; and Samour, Carlos M., 3,919,427.
San/Bar Corporation: *See—*
Gabrielson, Bruce C., 3,919,487.
Sandmann, Herbert: *See—*
Dietze, Wolfgang; and Sandmann, Herbert, 3,918,396.
Sandoz, Inc.: *See—*
Eberle, Marcel K.; and Manning, Robert E., 3,919,428.
Hardtmann, Goetz E., 3,919,210.
Houlihan, William J.; and Nadelson, Jeffrey, 3,919,323.
Houlihan, William J.; and Nadelson, Jeffrey, 3,919,309.
Sandoz Ltd.: *See—*
Egger, Helmut; and Reinshagen, Hellmuth, 3,919,290.
Falk, Heinz, 3,919,082.
Sanki Engineering Co., Ltd.: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., to American Home Products Corporation. 9-Oxoxanthene-N,N'-bis(substituted)-2,7-disulfonamides. 3,919,211, Cl. 260-246.00B.
Santilli, Victor E., to International Shoe Machine Corporation. Wiping method and lasting machine-shoe assembly combination used therewith. 3,918,115, Cl. 12-145.000.
Sargent & Greenleaf, Inc.: *See—*
Gartner, Klaus W.; and Uyeda, Tim M., 3,918,371.
Sasajima, Ken-ichi; and Yoneda, Masahiko, to Takeda Chemical Industries, Ltd. Method of producing d-ribose. 3,919,046, Cl. 195-30.000.
Sato, Akira; Ikeda, Tadashi; Shiba, Keisuke; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,918,979, Cl. 96-137.000.
Sato, Hiroki; Saito, Toseki; Hirano, Koji; and Takahashi, Hiroh, to Sony Corporation. Electronic storage tube. 3,919,587, Cl. 315-12.000.
Sato, Minoru; Aso, Tadashi; Oonishi, Kenichi; Hashimoto, Mitiyoshi; Murayama, Tuneyasu; and Horiuchi, Tadanori, to Honda Giken Kogyo Kabushiki Kaisha. Side-stand for motorcycle. 3,918,743, Cl. 280-293.000.
Satzinger, Gerhard: *See—*
Herrmann, Wolfgang Dieter; Stoss, Peter Johannes; and Satzinger, Gerhard, 3,919,310.
Sauer, Winfriede: *See—*
Berger, Herbert; Gail, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, 3,919,200.
Saville, Russell H.; and Johnson, Douglas M., to Fluoroware, Inc. Wafer holder. 3,918,756, Cl. 294-31.200.

Sawhill, Duane L., to Olin Corporation. Chlorocyanuric acid manufacture. 3,919,217, Cl. 260-248.00C.

Scammon, Lawrence W., Jr.; and Carlson, Leon E., to Sprague Electric Company. Shipping package for semiconductor chips. 3,918,581, Cl. 206-334.000.

Schabacher, Werner; Rohe, Hermann; Keller, Wolfgang; and Spreckelmeyer, Bernhard, to Bayer Aktiengesellschaft. Process for purifying and condensing reaction gases in the production of hydrofluoric acid. 3,919,399, Cl. 423-488.000.

Schafer, Paul: *See—*
Jager, Horst; and Schafer, Paul, 3,919,183.

Schaller, Alfred: *See—*
Lohr, Gunther; Loffler, Franz; and Schaller, Alfred, 3,919,485.

Schalmath, Heinz: *See—*
vom Berg, Hugo; and Schalmath, Heinz, 3,918,118.

Schell, Charles E., III: *See—*
Weisstuch, Aaron; and Schell, Charles E., III, 3,918,300.

Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, to Ciba-Geigy AG. Monohydroxyphenyl carbinols. 3,919,331, Cl. 260-623.00R.

Schenectady Chemicals, Inc.: *See—*
Petersen, Kenneth C.; and Meader, Royal A., Jr., 3,919,181.
Quattrocicocchi, Eugene J., 3,919,141.

Schering Aktiengesellschaft: *See—*
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.
Vidic, Hans-Jorg; and Kieslich, Klaus, 3,919,047.

Schering Corporation: *See—*
Manero, Carlos; Escobar, Miguel; Hershberg, Emanuel B.; and Herzog, Hershel L., 3,918,200.
Villani, Frank J., 3,919,313.

Scheuchzer, Fredy. Carriage for grinding undulations in railway track rails. 3,918,215, Cl. 51-178.000.

Schick & Cie: *See—*
Schick, Georges, 3,919,688.

Schick, Georges, to Schick & Cie. Maximum-speed signalling device for motor vehicles. 3,919,688, Cl. 340-62.000.

Schick, John W.: *See—*
Cushman, Donald R.; and Schick, John W., 3,919,149.
Davis, Robert H.; Oberright, Edward A.; and Schick, John W., 3,919,093.

Schield, Ike: *See—*
Amor, Leonel da Fonseca, 3,918,423.

Schiff, Sidney, to Phillips Petroleum Company. Additives for lubricants and motor fuels. 3,919,094, Cl. 252-33.000.

Schillo, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Thyristor circuitry for providing automatic number identification services. 3,919,489, Cl. 179-27.00G.

Schindler, Joachim: *See—*
Krauch, Carl H.; Hill, Frank; Lehmann, Rudolf; Pfeiffer, Hans; and Schindler, Joachim, 3,919,045.

Schindler, Norbert; and Ploger, Walter, to Henkel & Cie G.m.b.H. Production of 1-aminoalkane-1,1-diphosphonic acids using nitriles, phosphorous acid and hydrogen halide. 3,919,296, Cl. 260-502.500.

Schinella, Richard D.; and Anthony, Michael P., to Fairchild Camera and Instrument Corporation. Method for fabricating double-diffused, lateral transistor. 3,919,005, Cl. 148-175.000.

Schirmann, Jean-Pierre; Tellier, Pierre; Mathais, Henri; and Weiss, Francis. Method for preparing azines. 3,919,256, Cl. 260-345.900.

Schlegel GmbH vormals Weill & Reineke: *See—*
Blose, Werner, 3,918,384.

Schlegel, William L.; Grabarczyk, Joseph E.; and Krihak, Robert J., to Komline-Sanderson Engineering Corporation. Articulated connector. 3,918,821, Cl. 403-57.000.

Schleich, Friedrich. Flexible pegs and connectors for use in a game or amusement device. 3,918,196, Cl. 46-29.000.

Schlumberger Technology Corporation: *See—*
Cubberly, Walter E., Jr., 3,918,519.

Schmalfeld, Paul; Hahn, Helmut; Lehmann, Joachim; and Kleisa, Kurt, to Metallgesellschaft Aktiengesellschaft. Process for post-treating hot briquettes and the like. 3,918,929, Cl. 44-10.00K.

Schmidt, Felix Helmut: *See—*
Weyer, Rudi; Aumuller, Walter; Hitzel, Volker; and Schmidt, Felix Helmut, 3,919,245.

Schmidt, Werner, to Carl Zeiss Stiftung. Laser with transverse mode and frequency selection. 3,919,665, Cl. 331-94.50C.

Schmitt, Bruno. Water skis. 3,918,114, Cl. 9-310.00R.

Schmitt, Felix: *See—*
Schmitt, Karl; Disteldorf, Josef; and Schmitt, Felix, 3,919,218.

Schmitt, Karl; Disteldorf, Josef; and Schmitt, Felix, to Veba Chemie AG. Stable polyisocyanates and process therefor. 3,919,218, Cl. 260-248.0NS.

Schmitt, Robert A.: *See—*
Carlson, Lloyd; and Schmitt, Robert A., 3,918,575.

Schmitz, Alfred E., to Turenne, Charles A., a part interest. Casket with internal body supports. 3,918,133, Cl. 27-2.000.

Schmuck, Peter, to Hilti Aktiengesellschaft. Electrical contact arrangement for disengageable parts of an electric tool. 3,919,573, Cl. 310-50.000.

Schmuck, Peter, to Hilti Aktiengesellschaft. Motor commutator dust shield member for use in an electrically operated drilling device. 3,919,574, Cl. 310-68.000.

Schneider, Barry: *See—*
Lamz, Richard A.; and Schneider, Barry, 3,918,647.

Schneider, Vernon J. Fishing float and method of assembly. 3,918,193, Cl. 43-43.100.

Schneider, William E., to United States of America, Navy. Pressure compensated hydraulic accumulator. 3,918,498, Cl. 138-31.000.

Schneider, William P.: *See—*
Pike, John E.; and Schneider, William P., 3,919,293.

Schneider, Wolfgang, to Sulzer KSB Kernkraftwerkspumpen GmbH. Motor-pump aggregate for use in nuclear reactors. 3,918,830, Cl. 415-122.000.

Schneider, Wolfgang: *See—*
Weber, Johannes; and Schneider, Wolfgang, 3,919,575.

Schnitzius, Klaus, to Stabilus GmbH. Electrically conductive pneumatic spring with door actuated switch means. 3,919,509, Cl. 200-61.620.

Schoffmann, Rudolf, to Allis-Chalmers Corporation. Method of bending or straightening a continuously cast metal strand with controlled cooling. 3,918,514, Cl. 164-89.000.

Scholes, Addison B.; and Semans, Bruce F., to Ball Corporation. Electrostatic scrubber-precipitator. 3,919,391, Cl. 423-240.000.

Schon, Otmar, to Greer Hydraulics, Inc. Pressure accumulator. 3,918,497, Cl. 138-30.000.

Schoon, David J., to Minnesota Mining and Manufacturing Company. Object positioning apparatus. 3,919,545, Cl. 250-201.000.

Schorr, Anthony Joseph, to Bell Telephone Laboratories, Incorporated. Encapsulation for light emitting element providing high on-off contrast. 3,919,585, Cl. 313-499.000.

Schott, Stuart: *See—*
Murib, Jawad H.; Schott, Stuart; and Bonecutter, Charles A., 3,919,320.

Schott, Wayne M., to Zenith Radio Corporation. Passive four-channel decoder. 3,919,478, Cl. 179-1.0GQ.

Schreiber, Sidney P.: *See—*
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., 3,919,439.

Schroder, Heinz-Jurgen, to Kraftwerk Union Aktiengesellschaft. Steam generator. 3,918,409, Cl. 122-32.000.

Schroder, Horst: *See—*
Halliger, Leonhard; and Schroder, Horst, 3,918,779.

Schroeder, Charles F., to Owens-Corning Fiberglas Corporation. Reinforcement of rubber. 3,919,018, Cl. 156-85.000.

Schuhmacher, Alfred; Hiller, Heinrich; and Redeker, Joerg, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of 3-aminobenzoylbenzoic acids. 3,919,303, Cl. 260-517.000.

Schultes, Hermann, to Olin Corporation. Ski stopper. 3,918,730, Cl. 280-11.13B.

Schulz, David A., to Union Carbide Corporation. Process for producing high mesophase content pitch fibers. 3,919,376, Cl. 264-102.000.

Schulz, Peter: *See—*
Reh, Klaus; and Schulz, Peter, 3,919,599.

Schumacher, Bernd: *See—*
Ullmann, Werner; Schumacher, Bernd; Marti, Peter; and Vasalli, Caspar, 3,919,516.

Schundehutte, Karl-Heinz: *See—*
Leverenz, Klaus; and Schundehutte, Karl-Heinz, 3,919,214.

Schurenberg, Rudi, to Torkret GmbH, Firma. Piston pump for viscous materials. 3,918,849, Cl. 417-313.000.

Schuster, Ernst, to L. & C. Steinmuller GmbH. Method of incinerating pre-treated industrial wastes. 3,918,372, Cl. 110-7.00R.

Schutz, Gerhard: *See—*
Huber, Max; and Schutz, Gerhard, 3,918,688.

Schwarz, Alfred Otto: *See—*
Friedrichsen, Hans Jack; Mahr, Peter Frank; and Schwarz, Alfred Otto, 3,919,503.

Schwarzer, Johann: *See—*
Eckert, Hans-Werner; Nikolaus, Peter; and Schwarzer, Johann, 3,919,091.

Schweinberger, Manfred P. Column base assembly. 3,918,229, Cl. 52-295.000.

Schweizer, Kurt: *See—*
Durst, Roland; and Schweizer, Kurt, 3,918,594.

Schwendener, Derek Kurt: *See—*
Adderley, Edward; and Schwendener, Derek Kurt, 3,918,993.

Schwenninger, Ronald L., to PPG Industries, Inc. Method and apparatus for preventing erosion of a glass furnace basin wall. 3,918,949, Cl. 65-26.000.

Schweppe, Heinz: *See—*
Horster, Horst; Pusschert, Walter Alfred; Schweppe, Heinz; and Czarnojan, Wolfram, 3,919,570.

Schwippert, Guustaaf Arthur; and Smits, Wouter, to Mars, Inc. Coin arrival sensor. 3,918,563, Cl. 194-100.00A.

SCM Corporation: *See—*
Bonsack, James Paul, 3,919,400.

Scotese, Anthony C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,919,211.

Scothorn, Thomas R.: *See—*
Hennells, Ransom J.; and Scothorn, Thomas R., 3,918,359.

Scott & Fetzer Company, The: *See—*
Upton, Albert E., Jr., 3,918,511.

Scott, James H.: *See—*
Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, 3,919,540.

Scott, Robert N.; and Hooks, Haywood, Jr., to Olin Corporation. 1,7-Bis(sulfonic acid)-m-carboranes. 3,919,298, Cl. 260-503.000.

Scovill Manufacturing Company: *See—*
Stroh, William Sylvester, 3,918,482.

Scruggs, Carol L. Proximity sensing device using an inductance and capacitance resonant bridge network. 3,919,629, Cl. 324-41.000.
Seaquist Valve Company, Div. of Pittway Corporation: *See—*
Ewald, Ronald F., 3,918,611.
Secondary Processing Systems: *See—*
Brumagim, Ivan S., 3,919,087.
Sedlmeyer, Axel: *See—*
Fettweis, Alfred; and Sedlmeyer, Axel, 3,919,671.
Seel, Howard J.: *See—*
Southam, Donald L.; and Seel, Howard J., 3,918,363.
Segal, Leon, to Allied Chemical Corporation. Method of rapidly forming hollow objects from reinforced plastic sheeting. 3,919,386, Cl. 264-255.000.
Seibt, Klaus, to Seikt & Kapp Maschinenfabrik. Washing laundry articles. 3,918,112, Cl. 8-158.000.
Seidel, William C.: *See—*
Mitchell, William A.; and Seidel, William C., 3,919,408.
Seikt & Kapp Maschinenfabrik: *See—*
Seibt, Klaus, 3,918,112.
Sekigawa, Toshihiro: *See—*
Tarui, Yasuo; Sekigawa, Toshihiro; and Hayashi, Yutaka, 3,919,006.
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,919,007.
Sekine, Hiroshi; Maruyama, Tadakatsu; and Yamada, Katsutoshi, to Nippon Steel Corporation. Method for producing efficienty a high toughness and high tensile strength steel materials. 3,918,999, Cl. 148-12.00F.
Self, Kenneth R.: *See—*
Bourgraf, Elroy E.; Dunn, Robert E.; and Self, Kenneth R., 3,918,554.
Selmeczi, Joseph G., to Dravo Corporation. Process for sulfur dioxide removal from combustion gases. 3,919,393, Cl. 423-242.000.
Selmeczi, Joseph G., to Dravo Corporation. Process for the removal of oxides of sulfur from a gaseous stream. 3,919,394, Cl. 423-242.000.
Semans, Bruce F.: *See—*
Scholes, Addison B.; and Semans, Bruce F., 3,919,391.
Senior, Franklin C., to Feed Recycling Co. Process for recovering livestock food from cattle excreta waste. 3,919,433, Cl. 426-320.000.
Sequin, Carlo Heinrich: *See—*
Mohsen, Amr Mohamed; and Sequin, Carlo Heinrich, 3,918,997.
Setco la Chaux-de-Fonds S.A.: *See—*
Pulzer, Jean-Bernard, 3,918,425.
Seto, Jingo. Simplified process and apparatus for the production of cups from a foamed thermoplastic sheet. 3,919,368, Cl. 264-45.000.
Seto, Kunihira: *See—*
Arai, Atsuaki; Okazaki, Masaki; Hibino, Noburo; and Seto, Kunihira, 3,918,976.
Shaffer, John W.: *See—*
Armstrong, Donald E.; Brown, Stephen V.; and Shaffer, John W., 3,918,883.
Shaffer, Robert L., to Ecodyne Corporation. Surface skimming system. 3,919,090, Cl. 210-523.000.
Shapland, Earl P., Jr., to United States Steel Corporation. Sliding gate having selectively operable gas line for porous plug. 3,918,613, Cl. 222-148.000.
Shapler, Thomas A.: *See—*
Dybala, Ambrose B.; Jesiolowski, David; Nowicki, Casimir W.; and Shapler, Thomas A., 3,918,874.
Shaw, Bevil J.; and Miller, Richard P., to United States of America, Navy. Sputtering of bone on prostheses. 3,918,100, Cl. 3-1.900.
Shaw, Richard, Jr.: *See—*
O'Connor, Bernard J.; Shaw, Richard, Jr.; and Epstein, Michael, 3,918,309.
Shayman, Harry I. Acoustical fire-retardant wall and ceiling tile. 3,919,444, Cl. 428-95.000.
Sheaffer, Victor Earl: *See—*
Anstett, Raymond Michael; Buck, Charles Edward; and Sheaffer, Victor Earl, 3,919,101.
Sheeley, Larry M.: *See—*
Milani, Humbert, 3,918,550.
Sheeley, Robert M.: *See—*
Milani, Humbert, 3,918,550.
Shelby, Richard K.: *See—*
Logomasini, James C.; and Shelby, Richard K., 3,918,872.
Sheldon, Frederick John: *See—*
Firth, Angus Christopher; and Sheldon, Frederick John, 3,918,734.
Shell Oil Company: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 3,919,252.
Isaac, Eirlys R.; and Barker, Michael D., 3,919,251.
Kwantes, Arien; and Stouthamer, Bernhard, 3,919,330.
Sherwood Medical Industries Inc.: *See—*
Talonn, Daniel A., 3,918,912.
Shiba, Keisuke: *See—*
Sato, Akira; Ikeda, Tadashi; Shiba, Keisuke; and Takei, Haruo, 3,918,979.
Shibata, Akira, to Chugai Electric Co. Method for producing wear-resistant ferrous sintered metal containing high amounts of titanium carbide grains and carbon particles. 3,918,924, Cl. 29-182.800.
Shibata, Minoru: *See—*
Iwasawa, Maozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,352.
Iwasawa, Naozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,350.
Shier, George D., to Dow Chemical Company, The. Preparation of phenylmaleic anhydride. 3,919,259, Cl. 260-346.800.
Shiina, Toshio, to Ricoh Co., Ltd. Method of making a double flanged timing belt pulley. 3,918,515, Cl. 164-137.000.
Shima, Kiyoshi. Marine steering and propulsion device. 3,918,389, Cl. 115-34.00B.
Shimazaki, Mamoru: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 3,918,802.
Shimizu, Takuji; Ohara, Isao; and Yasuda, Kenji, to OJI Paper Co., Ltd. Color developing high impact polystyrene sheet and method of developing color images inside the same. 3,919,450, Cl. 428-307.000.
Shimodaira, Tadayoshi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Printing mechanism. 3,918,568, Cl. 197-49.000.
Shindo, Masatoshi; Tsuchiya, Shiro; and Takegami, Kazuo, to Mitsui Petrochemical Industries, Ltd.; and Hitachi Shipbuilding and Engineering Co., Ltd. Apparatus for heating a pipe made of a thermoplastic synthetic resinous material. 3,918,892, Cl. 432-36.000.
Shinhama Pump Mfg. Co., Ltd.: *See—*
Kishi, Emitsu; Shinohara, Osamu; and Ishikawa, Haruhisa, 3,918,661.
Shinohara, Osamu: *See—*
Kishi, Emitsu; Shinohara, Osamu; and Ishikawa, Haruhisa, 3,918,661.
Shinshu Seiki Kabushiki Kaisha: *See—*
Shimodaira, Tadayoshi, 3,918,568.
Shiraga, Ken: *See—*
Onoda, Takeru; Ohno, Akihisa; and Shiraga, Ken, 3,919,294.
Shirane, Yasuhiro: *See—*
Kitaoka, Takashi; Shirane, Yasuhiro; and Yamada, Junzo, 3,918,369.
Shire, Bernard S.: *See—*
Bedner, Michael P., 3,918,471.
Shiren, Norman S.: *See—*
Cozzo, Joseph; Garrod, David K.; Kazyaka, Thomas G.; Melcher, Robert L.; and Shiren, Norman S., 3,919,700.
Shishkin, Alexandr Nikolaevich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.
Shoemaker, Philip D.; and McQueary, Hobert O., to Ellingson Timber Company. Polyisocyanate:formaldehyde binder system for cellulosic materials. 3,919,017, Cl. 156-62.200.
Short, James Harold: *See—*
Herrin, Marley Ann; and Short, James Harold, 3,919,414.
Showa Denko Kabushiki Kaisha: *See—*
Matsushima, Tomoo; and Odajima, Tsutou, 3,918,959.
Shreeve, Nicholas Gilbert: *See—*
Mihalik, Nandor; and Shreeve, Nicholas Gilbert, 3,918,702.
Shroff, Shrenik: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,919,110.
Shuman, Dennis A.: *See—*
Meyer, Rich B.; and Shuman, Dennis A., 3,919,192.
Shuttleworth, Richmond G.; and Williams, Donald L., to United Technologies Corporation. Stator construction for an axial flow compressor. 3,918,832, Cl. 415-217.000.
Sibbett, Donald J.: *See—*
Moyer, Rudolph H.; and Sibbett, Donald J., 3,918,908.
Siegel, Frederick P., to Akzona Incorporated. Water absorption base. 3,919,430, Cl. 424-365.000.
Siegel, Hardo: *See—*
Merkle, Hans Rupert; and Siegel, Hardo, 3,919,261.
Siemens Aktiengesellschaft: *See—*
Appel, Horst; Bohm, Klaus; and Gleissner, Gerhard, 3,919,634.
Dietze, Wolfgang; and Sandmann, Herbert, 3,918,396.
Fenner, Erich; and Kuschke, Renate, 3,919,099.
Fettweis, Alfred; and Sedlmeyer, Axel, 3,919,671.
Friedel, Rudolf; and Lauterbach, Richard, 3,919,124.
Haass, Adolf, 3,919,647.
Habock, Adolf; and Holtz, Joachim, 3,919,607.
Hermstein, Wolfgang, 3,919,626.
Klautschek, Herwig; and Kollensperger, Dieter, 3,919,609.
Lohr, Gunther; Loffler, Franz; and Schaller, Alfred, 3,919,485.
Noack, Dieter, 3,919,511.
Tappeiner, Hermann, 3,919,624.
Sierra Engineering Co.: *See—*
Devaney, Robert P.; Fellner, Erwin J.; and Cohen, William A., 3,918,098.
Sigal, Isaak Yakovlevich; Naidenov, Georgy Fedorovich; Nizhnik, Sergei Savatievich; and Gurevich, Nikolai Alexandrovich. Method of reducing the concentration of nitrogen oxides in a gaseous effluent from a thermal plant. 3,918,834, Cl. 431-10.000.
Sigdell, Jan-Erik; and Buser, Martin, to Hoffmann-La Roche Inc. Apparatus for the measurement of the volume and flow rate of liquids. 3,919,455, Cl. 73-226.000.
Sillion, Bernard: *See—*
Bourdoncle, Bernard; and Sillion, Bernard, 3,919,187.

Silvana, Baracchi. Universal coupling. 3,918,679, Cl. 251-149.100.

Silverstone, Calvin Eric; and Noble, David Stanley, to Caterpillar Tractor Company. Regenerative heat exchanger matrix. 3,918,517, Cl. 165-10.000.

Simciak, Walter, to Northern Illinois Gas Company. Simultaneous analog and digital data transfer. 3,919,640, Cl. 325-30.000.

Simmons, Robert L.: *See*—
VanderMeer, Richard H.; and Simmons, Robert L., 3,918,598.

Simon, Georges: *See*—
Pierre, Bernard; Volle, Rene; and Simon, Georges, 3,918,347.

Simpson, Harold Graves. Construction system. 3,918,233, Cl. 52-747.000.

Simpson, Verne G.: *See*—
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,919,161.

Singer, Barry M., to North American Philips Corporation. Direct view infra-red to visible light converter. 3,919,555, Cl. 250-332.000.

Singer Company, The: *See*—
Evans, John L.; Ferriss, Lincoln S.; and Hoffmann, Jay, 3,918,310.
Fritts, Russell A., 3,918,780.
Pommers, Ansis; and Lotz, Robert W., 3,919,526.
Vattuone, Evor S., 3,919,535.

Singer, Leonard S., to Union Carbide Corporation. Process for producing high mesophase content pitch fibers. 3,919,387, Cl. 264-344.000.

Sinnreich, Manfred. Fallopian tube obturating device. 3,918,431, Cl. 128-1.00R.

Sircar, Jagadish C.; and Zinnes, Harold, to Warner-Lambert Company. 2-Methyl-2-[2-(1,2,3,4,-tetrahydro-9-methyl carbazol-4-ylidene)-ethyl]1,3-cyclopentane dione. 3,919,203, Cl. 260-240.00R.

Sirotkin, Boris Vasilievich: *See*—
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Sivograkova, Klavdiya Andreevna: *See*—
Ballova, Galina Dmitrievna; Egorova, Ekaterina Ivanovna; Sivograkova, Klavdiya Andreevna; Bezborodko, Georgy Lazarevich; Lebedeva, Mariya Moiseevna; Rusinovskaya, Irina Ivanovna; Maladzyanova, Larisa Fedorovna; Maximov, Vladimir Nikolaevich; and Ostrovskaya, Tamara Nikolaevna, 3,919,355.

Skelton, Charles Roger; Marshall, Joseph William; Oxlade, Roy Ronald; and Gibson, Keith Cyril, to British Steel Corporation. Rolling mill test equipment. 3,918,302, Cl. 73-141.00R.

SKF Industrial Trading and Development Company B.V.: *See*—
Halliger, Leonhard; and Schroder, Horst, 3,918,779.
Nakk, Lembit, 3,918,277.

Skujins, Peter: *See*—
Coyner, Robert N.; and Skujins, Peter, 3,919,173.

Slama, Karel: *See*—
Hejno, Karel; Slama, Karel; and Sorm, Frantisek, 3,919,260.

Small, Hamish; and Stevens, Timothy S., to Dow Chemical Company, The. Determining total ionic content. 3,918,906, Cl. 23-230.00R.

Smarook, Walter H., to Union Carbide Corporation. Bristled article and process. 3,919,378, Cl. 264-164.000.

Smarook, Walter H., to Union Carbide Corporation. Forming a multicell container from a blank of a thermoformable material. 3,919,379, Cl. 264-164.000.

Smarook, Walter H.; and Sonia, John, to Union Carbide Corporation. Process for expanding annealed thermoformable materials. 3,919,380, Cl. 264-164.000.

Smarook, Walter H., to Union Carbide Corporation. Process for expanding a thermoformable preform network configuration. 3,919,381, Cl. 264-164.000.

Smarook, Walter H., to Union Carbide Corporation. Expanding process with non-aligned molds. 3,919,382, Cl. 264-164.000.

Smarook, Walter H., to Union Carbide Corporation. Process for forming expanded laminates and products. 3,919,445, Cl. 428-116.000.

Smarook, Walter H., to Union Carbide Corporation. Process for expanding thermoformable materials and products. 3,919,446, Cl. 428-116.000.

Smentek, Hans-Dietrich: *See*—
Espenschied, Helmut; Rothfuss, Georg; and Smentek, Hans-Dietrich, 3,918,312.

Smets, Georges Joseph: *See*—
Evens, Georges Gerard; and Smets, Georges Joseph, 3,918,972.

Smith, Anthony: *See*—
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, 3,919,119.

Smith, Baynard R.; and Treptow, Arnold W., to Electro Oxide Corporation. Bonded solderable silver article, composition, and method of bonding silver to a ceramic substrate. 3,918,980, Cl. 106-1.000.

Smith, Clifford L.: *See*—
Smith, Raymond L., 3,918,745.

Smith, Frederick R., to FMC Corporation. Process for producing high fluid-holding fiber mass. 3,919,385, Cl. 264-184.000.

Smith, Glendon: *See*—
Mauch, Hans A.; and Smith, Glendon, 3,918,179.

Smith, Graham C.: *See*—
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 3,919,252.

Smith, James D. B.: *See*—
Foster, Newton C.; and Smith, James D. B., 3,919,348.

Smith, Larry David: *See*—
Murphy, Dennis E.; and Smith, Larry David, 3,918,755.

Smith & Nephew Polyfabrik Limited: *See*—
Dow, James; Lloyd, Ronald; and Patchell, Albert George, 3,919,377.

Smith, Raymond L., to Smith, Raymond L.; and Smith, Clifford L., part interest to each. Safety connector for towed vehicle. 3,918,745, Cl. 280-457.000.

Smith, Robert A., to General Electric Company. Room temperature vulcanizable silicone rubber composition. 3,919,136, Cl. 260-9.000.

Smith, Robin: *See*—
Phillipson, Alan; Spiller, Basil Harry Royston; Newman, Cyril Leslie; and Smith, Robin, 3,918,875.

Smith, Roy F. Window guards. 3,918,202, Cl. 52-106.000.

Smith, Trevor Stanley, to Lucas Aerospace Limited. Fuel system for a gas turbine engine. 3,918,253, Cl. 60-39.28R.

SmithKline Corporation: *See*—
Anderson, Elvin L.; and Graboyes, Harold, 3,919,312.
Hill, Harlan F.; and Lafferty, John J., 3,919,230.

Smithson, Harold R., to Oxy-Catalyst, Incorporated. Combined adaptor and container for emptying and refilling container. 3,918,487, Cl. 137-588.000.

Smits, Wouter: *See*—
Schwippert, Guustaaf Arthur; and Smits, Wouter, 3,918,563.

Smolka, Carl M., to General Dynamics Corporation. Automatic antenna coupler utilizing system for measuring the real part of the complex impedance or admittance presented by an antenna or other network. 3,919,644, Cl. 325-174.000.

SMT Machine Company AB: *See*—
Svanstrom, Sven-Erik, 3,918,331.

Snavely, Earl S., Jr.; and Bertness, Theodore A., to Mobil Oil Corporation. Petroleum production by steam injection. 3,918,521, Cl. 166-272.000.

Snyder, Harry R., Jr.: *See*—
Spencer, Claude F.; and Snyder, Harry R., Jr., 3,919,238.

Snyder, Keith A.: *See*—
Cullen, Francis M.; Roshon, David D., Jr.; and Snyder, Keith A., 3,919,717.

Sobel, Jay E.; and Anderson, Robert F., to Universal Oil Products Company. Isobutane-butylene alkylation process. 3,919,343, Cl. 260-683.480.

Sobolev, Valerian Mikhailovich: *See*—
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi": *See*—
Fusey, Pierre, 3,919,112.

Societe Anonyme de Telecommunications: *See*—
Baillet, Gerard Eugene, 3,919,659.

Societe Anonyme des Ateliers Houget Duesberg Busson: *See*—
Bouhon, Pierre Hubert Marie Joseph, 3,918,246.

Societe Anonyme dite: L'Oreal: *See*—
Bugaut, Andree; and Laudon, Monique, 3,919,265.
Kalopissis, Gregoire; and Bugaut, Andree, 3,918,896.
Morane, Bruno P., 3,918,615.
Zviak, Charles; and Daeninckx, Jean, 3,919,419.

Societe Anonyme dite: Omnium Financier Aquitaine pour l'Hygiene et la Sante (SANOFI): *See*—
Ardry, Robert; and Robilliart, Michel, 3,919,186.

Societe Anonyme: Poclain: *See*—
Fontaine, Jacques P., 3,918,350.

Societe Anonyme Skis Rossignol: *See*—
Legrand, Maurice, 3,918,731.

Societe Francaise de Tuyaux Metalliques/Flexibles: *See*—
Charvet, Joseph, 3,918,285.

Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See*—
Carrasse, Jean; Gerard, Jacques; Pounhet, Pierre; and Martin, Therese, 3,918,516.

Societe Industrielle et Commerciale de Transformation des Plastiques"Slcopal": *See*—
Paris, Boris, 3,918,781.

Societe Lannionnaise d'Electronique Sle-Citerel: *See*—
Le Mouel, Bernard, 3,919,651.
Le Mouel, Bernard, 3,919,653.

Societe Lyonnaise des Applications Catalytiques: *See*—
Risse, Roger Paul Pierre, 3,918,880.

Societe Nationale des Petroles d'Aquitaine: *See*—
Sahores, Jean; and Larribau, Etienne, 3,919,549.

Soderstrom, Ronald L.: *See*—
Bowen, Arlen J.; Dickson, LeRoy D.; Goretzki, Jerome A.; Hendrickson, Kenneth E.; King, Donald P.; Kueper, Terrance W.; and Soderstrom, Ronald L., 3,919,527.

Sokal, Alan D.: *See—*
Sokal, Nathan O.; and Sokal, Alan D., 3,919,656.
Sokal, Nathan O.; and Sokal, Alan D. High-efficiency tuned switching power amplifier. 3,919,656, Cl. 330-51.000.
Sommer, Harold Z.; and Miller, Jacob I. Quaternary quinuclidinones. 3,919,240, Cl. 260-293.530.
Sommer, Harold Z.; and Miller, Jacob I., to United States of America, Army. Hydroxyquinuclidine derivatives. 3,919,241, Cl. 260-293.530.
Sommer, Harold Z.; and Krenzer, John, to United States of America, Army. Carbamates. 3,919,289, Cl. 260-479.00C.
Sommer, Karlheinz: *See—*
Borchert, Edgar; and Sommer, Karlheinz, 3,919,009.
Borchert, Edgar; and Sommer, Karlheinz, 3,919,010.
Sonia, John: *See—*
Smarook, Walter H.; and Sonia, John, 3,919,380.
Sonnenmoser, Hubert: *See—*
Fischer, Wilhelm; Kraush, Friedrich; Riesner, Walter; and Sonnenmoser, Hubert, 3,918,356.
Sons, James E., to Detprotector, Inc. Overload current protector for A. C. motors. 3,919,600, Cl. 317-13.00R.
Sony Corporation: *See—*
Fukami, Takeshi, 3,919,480.
Hamada, Osamu, 3,919,482.
Hideshima, Yasuhiro, 3,919,699.
Izumisawa, Masato; and Miyaoka, Senri, 3,919,712.
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,722.
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,723.
Nakamura, Takashi, 3,919,713.
Ohsawa, Mitsuo; and Onoe, Yukio, 3,919,645.
Okada, Takashi; and Utsunomiya, Kimitake, 3,919,567.
Sato, Hiroki; Saito, Toseki; Hirano, Koji; and Takahashi, Hiroh, 3,919,587.
Takashino, Shizuo, 3,918,660.
Soot, Olaf: *See—*
Fisher, Jules; and Soot, Olaf, 3,918,225.
Sorbie, Thomas B.: *See—*
Dunham, James A.; Federle, August J.; and Sorbie, Thomas B., 3,918,570.
Sorcery Metals, Inc.: *See—*
Baldwin, James French; and Maxwell, Douglas H., 3,918,964.
Sorm, Frantisek: *See—*
Hejno, Karel; Slama, Karel; and Sorm, Frantisek, 3,919,260.
Soukup, Franz: *See—*
Stark, Sven Olof Soren; Olsen, Jan-Erik; and Soukup, Franz, 3,918,237.
Southam, Donald L.; and Seel, Howard J., to Harris-Intertype Corporation. Multicolor sheet-fed printing press. 3,918,363, Cl. 101-183.000.
Souvay, Andre: *See—*
Remery, Michel; and Souvay, Andre, 3,919,590.
Soya, Isao; Kimura, Katsuhiko; Nobuto, Tooru; and Nagai, Yawara, to Olympus Optical Co., Ltd. System for detecting the particular chemical constituent of a fluid. 3,918,910, Cl. 23-253.00R.
Speaker Motion Systems, Inc.: *See—*
Wirth, Gary J.; and Gelder, Kenneth M., 3,918,572.
Spear, Harry Warren, to Beatrice Foods Co. Wall lock device. 3,918,278, Cl. 70-58.000.
Spector, George: *See—*
Conn, John L.; and Spector, George, 3,918,827.
Speier, John L.: *See—*
Le Grow, Gary E.; and Speier, John L., 3,919,276.
Spencer, Claude F.; and Snyder, Harry R., Jr., to Morton-Norwich Products, Inc. 9-(Substituted amino)imidazo(4,5-f) quinolines. 3,919,238, Cl. 260-288.0CF.
Sperry Rand Corporation: *See—*
Baker, Donald H.; and Bowe, Larry J., 3,919,529.
Jacobson, Peter E.; and Pirman, Robert L., 3,918,778.
Spewock, Metro: *See—*
Bratkowski, Walter V.; and Spewock, Metro, 3,919,676.
Spiegelberg, Hans: *See—*
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,919,311.
Kyburz, Emilio; and Spiegelberg, Hans, 3,919,321.
Spiessbach, Andrew J.; Parrish, William F.; and Kennedy, Paul G., to Westinghouse Electric Corporation. TV signal correction circuitry. 3,919,471, Cl. 178-7.100.
Spiller, Basil Harry Royston: *See—*
Phillipson, Alan; Spiller, Basil Harry Royston; Newman, Cyril Leslie; and Smith, Robin, 3,918,875.
Spiller, Lester L., to Ransburg Electro-Coating Corporation. Method and apparatus for applying dry starch particles to water wet cellulosic webs using electrostatic attraction. 3,919,042, Cl. 162-175.000.
Sprague Electric Company: *See—*
Alwitt, Robert S.; and Ross, Sidney D., 3,919,604.
Scammon, Lawrence W., Jr.; and Carlson, Leon E., 3,918,581.
Spreckelmeyer, Bernhard: *See—*
Schabacher, Werner; Rohe, Hermann; Keller, Wolfgang; and Spreckelmeyer, Bernhard, 3,919,399.
Sprung, Arnold: *See—*
Stugger, Walter F.; and Sprung, Arnold, 3,918,728.
Squire, Edward Noonan, to Du Pont de Nemours, E. I., and Company. Synthesis of aromatic amines by reaction of aromatic compounds with ammonia. 3,919,155, Cl. 260-571.000.
Stabilus GmbH: *See—*
Schnitzius, Klaus, 3,919,509.
Stach, Kurt: *See—*
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,919,226.
Stache, Ulrich: *See—*
Haede, Werner; Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Lindner, Ernst, 3,919,191.
Stallbaum, Jens: *See—*
Franz, Wolfgang; and Stallbaum, Jens, 3,918,432.
Stamicarbon B.V.: *See—*
Dahlmans, Johannes J.; and Meijerink, Theo A. J., 3,919,048.
Garritsen, Johan W.; and Penders, Josef M., 3,919,197.
Standard Oil Company, The: *See—*
Cerefice, Steven A.; and Fields, Ellis K., 3,919,262.
Milberger, Ernest C.; Dolhyj, Serge R.; and Miko, Steven J., 3,919,257.
Stanford Research Institute: *See—*
Acton, Edward M.; Lerom, Michael W.; and Stone, Herbert, 3,919,318.
Stanislaw, Peter: *See—*
Marino, Thomas; Kreeft, John; and Stanislaw, Peter, 3,918,362.
Stanke, Walter; and Mertens, Gottfried, to Heinrich Koppers GmbH. Sintering machine. 3,918,894, Cl. 432-137.000.
Stanzel, Victor. Trigger-launched jet plane. 3,918,197, Cl. 46-81.000.
Stark, Sven Olof Soren; Olsen, Jan-Erik; and Soukup, Franz, to Tetra Pak Development SA. Machine for the manufacture of filled and sealed containers. 3,918,237, Cl. 53-133.000.
Stary, Marvin L.: *See—*
Lee, Yuan C.; Kline, Jules M.; and Stary, Marvin L., 3,918,932.
Stauffer Chemical Company: *See—*
Baker, Don R., 3,919,418.
Dyer, James N.; and Yu, Arthur J., 3,919,137.
Jaffe, Fred; and Toy, Arthur D. F., 3,919,269.
Stauter, John C., to Continental Oil Company. Pyrite depression in coal flotation by the addition of sodium sulfite. 3,919,080, Cl. 209-167.000.
Steever, Raymond G. E., Jr.: *See—*
Cohen, Arthur L.; Garner, Gerald E.; and Steever, Raymond G. E., Jr., 3,919,553.
Stefanik, John E., to PPG Industries, Inc. Window panel edge construction. 3,919,022, Cl. 156-104.000.
Steil, Emeram, to Paul Ritzau Pari-Werk KG. Inhalator for pulverulent substances. 3,918,451, Cl. 128-260.000.
Steiman, Wolf, to VCA Corporation. Childproof actuator cap. 3,918,614, Cl. 222-153.000.
Stein, Hall, Limited: *See—*
Warrach, Wolfgang, 3,919,035.
Steiner, Sheldon. Electrified suspension ceiling system. 3,919,457, Cl. 174-48.000.
Steinmann, Helmut, to Robert Bosch G.m.b.H. Wiper-washer circuit arrangement. 3,919,613, Cl. 318-443.000.
Steinmann, Helmut: *See—*
Ratzel, Rudiger; and Steinmann, Helmut, 3,919,612.
Stendig, Joseph L.; and Davis, Claude A. Loop cord alarm system. 3,919,705, Cl. 340-280.000.
Stenger, Richard J., to Sun Ventures, Inc. Apparatus for testing traction coefficient and method of use thereof. 3,918,468, Cl. 137-3.000.
Stepanov, Gennady Arkadievich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.
Stephens, Donald E., to Beckman Instruments, Inc. Micro automatic amino acid analysis process and system. 3,918,907, Cl. 23-230.00R.
Sterer Engineering & Mfg. Co.: *See—*
Pauly, Joachim W.; and Leinberry, Wilbur Stanley, 3,918,291.
Sterling Drug Inc.: *See—*
Bailey, Denis M., 3,918,954.
Crounse, Nathan N.; and Ambrosiano, Nicholas A., 3,919,235.
Diana, Guy D., 3,919,202.
Stern Freres SA: *See—*
Piccino, Pierre-Michel; and Ringrose, Anthony Stephen, 3,918,640.
Stevens, Curtis E., to Bertea Corporation. Fault detection system for transducers. 3,919,703, Cl. 340-253.00R.
Stevens, Edward J., to Minnesota Mining and Manufacturing Company. Louvered film for unidirectional light from a point source. 3,919,559, Cl. 250-508.000.
Stevens, Frederick F., Jr., to Hoff-Stevens, Inc. Stopcock. 3,918,680, Cl. 251-287.000.
Stevens, Gene R.: *See—*
Ray, Dick, deceased; and Stevens, Gene R., 3,919,512.
Stevens, Timothy S.: *See—*
Small, Hamish; and Stevens, Timothy S., 3,918,906.
Stevenson, Charles E.; and Coffey, Henry F., to Eli Lilly and Company. Sampler-injector for liquid chromatography. 3,918,913, Cl. 23-259.000.

Stigmark, Lennaet: *See—*
Gulich, Tore; and Stigmark, Lennaet, 3,919,687.

Stilley, George W., to PPG Industries, Inc. Glass sheet tempering. 3,918,950, Cl. 65-114.000.

Stillions, Herbert C. Cutting unit for rotary lawn mowers. 3,918,241, Cl. 56-12.700.

Stine, Laurence O.; and Conner, Algie J., to Universal Oil Products Company. Fluidized catalyst regeneration process. 3,919,115, Cl. 252-417.000.

Stitt, Thomas D.: *See—*
McMurray, William; Plunkett, Allan B.; and Stitt, Thomas D., 3,919,620.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,919,246.

Stokes, Kenneth B.: *See—*
King, Wendell L.; and Stokes, Kenneth B., 3,918,460.

Stolzy, Albert Donald, to International Telephone and Telegraph Corporation. Gravitometer. 3,918,292, Cl. 73-32.00A.

Stone, Herbert: *See—*
Acton, Edward M.; Lerom, Michael W.; and Stone, Herbert, 3,919,318.

Stoss, Peter Johannes: *See—*
Herrmann, Wolfgang Dieter; Stoss, Peter Johannes; and Satzinger, Gerhard, 3,919,310.

Stout, Brian: *See—*
Stout, Harry E.; and Stout, Brian, 3,918,430.

Stout, Emmet E., to Chicago Pneumatic Tool Company. Overspeed safety control mechanism for rotary tools. 3,918,213, Cl. 51-170.00T.

Stout, Harry E.; and Stout, Brian. Solar heating system and components thereof. 3,918,430, Cl. 126-271.000.

Stouthamer, Bernhard: *See—*
Kwantes, Arien; and Stouthamer, Bernhard, 3,919,330.

Stracke, Karl-Hubert: *See—*
Reinbeck, Hans; Stracke, Karl-Hubert; and Collmer, Alfred, 3,919,576.

Strandine, Eldon J.; Panek, Mitchell W.; and Paige, John S., to Swift & Company. Method for dispatching poultry. 3,918,125, Cl. 17-45.000.

Stratman, Jerome F.; and Novak, John, to Tappan Company, The. Refuse compactor control system. 3,918,360, Cl. 100-52.000.

Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., to American Home Products Corporation. 11,15 Dimethyl-11 deoxy PGF_2 . 3,919,302, Cl. 260-514.00D.

Strobel, Albert; and Michetti, Anthony B., to I-T-E Imperial Corporation. Retaining means for circuit breaker handle. 3,919,514, Cl. 200-331.000.

Stroh, William Sylvester, to Scovill Manufacturing Company. Relief valve core. 3,918,482, Cl. 137-542.000.

Strouse, David, Jr.: *See—*
Hillner, Rudolf E.; Strouse, David, Jr.; and Hoch, Lou, 3,918,655.

Strunnikova, Ljudmila Viktorovna: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Stuber, Ivan L. Method and means for implanting casing. 3,918,523, Cl. 166-285.000.

Studiengesellschaft Kohle mbH: *See—*
Bogdanovic, Borislav, 3,919,325.

Stugger, Walter F.; and Sprung, Arnold. Snow ski and edge. 3,918,728, Cl. 280-11.13E.

Suehiro, Hideo: *See—*
Kikugawa, Kiyomi; Suehiro, Hideo; Ichino, Motonobu; and Nakamura, Tokuro, 3,919,194.

Sugarman, Nathan: *See—*
Palmer, Nigel Innes; Sugarman, Nathan; and Grammer, Don O'Neil, 3,918,995.

Sugita, Tadashi: *See—*
Kida, Kihachi; Akane, Takahiro; Hosoe, Satosi; and Sugita, Tadashi, 3,918,326.

Sugiyama, Satoshi; and Ariga, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Storage controlling apparatus for a sheet-like material sorting system. 3,918,704, Cl. 271-201.000.

Suko, Shoichi; Uchida, Kozo; and Tamada, Seiichi, to Iwasaki Tsushinki Kabushiki Kaisha. Overcurrent protection circuit [for an object circuit]. 3,919,601, Cl. 317-31.000.

Sulzer Brothers Limited: *See—*
Eichler, Joachim, 3,918,102.
Huber, Max; and Schutz, Gerhard, 3,918,688.

Sulzer KSB Kernkraftwerkspumpen GmbH: *See—*
Gaffal, Karl; Honold, Ernst; and Martens, Rolf, 3,918,689.
Schneider, Wolfgang, 3,918,830.

Suman, George O., Jr. Well completion method and system. 3,918,522, Cl. 166-285.000.

Sumitomo Chemical Company, Limited: *See—*
Hirata, Hidekazu; and Sakai, Siro, 3,919,140.

Sumitomo Metal Industries Limited: *See—*
Kitaoka, Takashi; Shirane, Yasuhiro; and Yamada, Junzo, 3,918,369.

Summers, Paul E.; and Gelbard, Robert B., to General Electric Company. Temperature and air flow controlling apparatus of a household refrigerator. 3,918,269, Cl. 62-180.000.

Sun Studs, Inc.: *See—*
Wilcox, William H., deceased, 3,918,334.

Sun Ventures, Inc.: *See—*
Stenger, Richard J., 3,918,468.

Sundequist, Ake, to Ake Sundequist Konsult AB. Mounting bar system for attaching interior fittings and electric wiring to a concrete ceiling. 3,918,224, Cl. 52-221.000.

Sunder, Shyam: *See—*
Trepanier, Donald L.; and Sunder, Shyam, 3,919,215.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,216.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,219.
Trepanier, Donald L.; and Sunder, Shyam, 3,919,220.

Sunderman, David J.: *See—*
Burst, Francis J.; Fullenkamp, Eugene H.; Scott, James H.; Sunderman, David J.; and Foster, L. Dale, 3,919,540.

Supancic, John A., Jr., to General Electric Company. Capacitor fill tube and seal. 3,918,474, Cl. 141-98.000.

Surgical Mechanical Research, Inc.: *See—*
Grams, Guenter A., 3,918,477.

Sutter, Hanspeter, to Luwa AG. Shutoff device. 3,918,674, Cl. 251-5.000.

Sutures, Inc.: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 3,919,442.

Suyama, Tadashi: *See—*
Toyoshima, Shigeshi; Kanao, Seizo; Toyoda, Takeshi; and Suyama, Tadashi, 3,919,291.

Suzuki, Kenzo; Mizobuchi, Toshio; and Kase, Makoto, to Riken Piston Ring Kogyo Kabushiki Kaisha. Method of making iron-copper alloy. 3,918,957, Cl. 75-10.00R.

Suzuki, Masatosi: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,919,123.

Suzuki, Yoshihisa, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Daiwa Boseki Kabushiki Kaisha. Mechanism for driving a spinning rotor of the open-end spinning apparatus. 3,918,248, Cl. 57-101.000.

Svab, James E.: *See—*
McCormack, Donald H.; and Svab, James E., 3,918,753.

Svanstrom, Sven-Erik, to SMT Machine Company AB. Lathes. 3,918,331, Cl. 82-2.00R.

Swaanen, Petrus Henricus: *See—*
Bol, Arie; van Ginkel, Johannes; Van Der Schoot, Andrianus Henricus Maria; and Swaanen, Petrus Henricus, 3,918,151.

Sweet, Dale F. Rotary lawn mower. 3,918,119, Cl. 15-328.000.

Swift & Company: *See—*
Strandine, Eldon J.; Panek, Mitchell W.; and Paige, John S., 3,918,125.

Swingle, Benny F., to Environmental Development Corporation. Hydrogen-fueled internal-combustion and steam engine power plant. 3,918,263, Cl. 60-614.000.

Sybron Corporation: *See—*
Horn, Anton James, 3,918,459.
Peart, Edward Lynn; and Martin, Billy Otis, 3,918,436.

Sylvania Electric Products Inc.: *See—*
Armstrong, Donald E.; Brown, Stephen V.; and Shaffer, John W., 3,918,883.

Synowka, Theodore W.: *See—*
Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., 3,918,304.

Syracuse University Research Corporation: *See—*
Aldrich, Robert G., 3,918,761.

System Development Corporation: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 3,919,462.

Szabo, Karoly, to Exxon Research and Engineering Company. Alkoxyalkyl phosphonates. 3,919,359, Cl. 260-942.000.

Tabata, Frank M.: *See—*
Cantillo, Enrique J.; Tabata, John D.; and Tabata, Frank M., 3,918,110.

Tabata, John D.: *See—*
Cantillo, Enrique J.; Tabata, John D.; and Tabata, Frank M., 3,918,110.

Takahara, Hiroaki: *See—*
Kitayama, Teruki; Takahara, Hiroaki; and Ogawa, Hiroshi, 3,918,951.

Takahashi, Akikazu; Futatsugi, Yuji; Yao, Takamu; and Higashide, Yoichi, to Dainippon Ink & Chemicals Inc. Shatterproof glass bottle. 3,919,440, Cl. 428-35.000.

Takahashi, Hiroh: *See—*
Sato, Hiroki; Saito, Toseki; Hirano, Koji; and Takahashi, Hiroh, 3,919,587.

Takahashi, Tadashi; and Onishi, Kazuo, to Hitachi, Ltd. Braking device for a small DC motor. 3,919,611, Cl. 318-380.000.

Takamatsu, Hideki: *See—*
Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, 3,919,363.

Takano, Eiichi, to Canon Kabushiki Kaisha. Zoom lens having a shiftable diaphragm disposed between two zoom components. 3,918,797, Cl. 350-186.000.

Takano, Eiichi, to Canon Kabushiki Kaisha. Zoom lens having two diaphragms. 3,918,798, Cl. 350-186.000.
Takashino, Shizuo, to Sony Corporation. Brake mechanism for magnetic tape recording and reproducing apparatus. 3,918,660, Cl. 242-204.000.
Takayama, Toru: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, to Mitsubishi Chemical Industries Ltd. Process for polymerizing olefins. 3,919,185, Cl. 260-93.700.
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, to Eisai Co., Ltd. Process for preparation of coated medicines. 3,919,436, Cl. 427-3.000.
Takeda Chemical Co., Ltd.: *See—*
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, 3,919,207.
Takeda Chemical Industries, Ltd.: *See—*
Sasajima, Ken-ichi; and Yoneda, Masahiko, 3,919,046.
Takegami, Kazuo: *See—*
Shindo, Masatoshi; Tsuchiya, Shiro; and Takegami, Kazuo, 3,918,892.
Takei, Haruo: *See—*
Sato, Akira; Ikeda, Tadashi; Shiba, Keisuke; and Takei, Haruo, 3,918,979.
Talkington, Howard R., to United States of America, Navy. Surface tracker for an underwater vehicle. 3,918,113, Cl. 9-8.00R.
Taller, Robert Arthur, to Union Carbide Corporation. Single package 100 percent solids urethane coating compositions. 3,919,174, Cl. 260-77.5AB.
Talonn, Daniel A., to Sherwood Medical Industries Inc. Blood oxygenator. 3,918,912, Cl. 23-258.50B.
Tamada, Seiichi: *See—*
Suko, Shoichi; Uchida, Kozo; and Tamada, Seiichi, 3,919,601.
Tamura, Heihachiro: *See—*
Hayakawa, Shuichi; Hironaka, Toru; Osada, Yukinori; Tamura, Heihachiro; Takayama, Toru; and Saito, Shiro, 3,918,375.
Tanaka, Yuji: *See—*
Kiuchi, Akira; and Tanaka, Yuji, 3,919,049.
Taniguchi, Yoshitaka: *See—*
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, 3,919,436.
Tantraporn, Wirojana: *See—*
Yu, Se Puan; and Tantraporn, Wirojana, 3,919,667.
Tappan Company, The: *See—*
Perl, Richard L., 3,918,479.
Stratman, Jerome F.; and Novak, John, 3,918,360.
Tappeiner, Hermann, to Siemens Aktiengesellschaft. Self commutating static converter. 3,919,624, Cl. 321-45.00C.
Tarozzi, Raffaele: *See—*
Palumbo, Luigi; and Tarozzi, Raffaele, 3,918,963.
Tarui, Yasuo; Sekigawa, Toshihiro; and Hayashi, Yutaka. Method of manufacturing a lateral transistor. 3,919,006, Cl. 148-175.000.
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, to Kogyo Gijutsuin. Method of manufacturing a field-effect transistor. 3,919,007, Cl. 148-189.000.
Tatara, Shiyokichi: *See—*
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,722.
Nakajima, Heitaro; Kawakami, Hirotake; and Tatara, Shiyokichi, 3,918,723.
Tatsuta, Hiroshi: *See—*
Asai, Komei; Moriyama, Akio; Tatsuta, Hiroshi; and Fukai, Masakazu, 3,919,106.
Taub, David: *See—*
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,919,253.
Taub Family Trust u/a Sept. 1, 1967: *See—*
Taub, Ronald H., 3,918,576.
Taub, Ronald H., to Taub Family Trust u/a Sept. 1, 1967. Combination shipping container and display support. 3,918,576, Cl. 206-44.000.
Taylor, Edward A., to Construction Forms, Inc. Concrete hose and coupling. 3,918,749, Cl. 285-256.000.
Taylor, Walter: *See—*
Crawley, Stanley; and Taylor, Walter, 3,918,209.
Technical Resources, Inc.: *See—*
Saba, Joseph M., 3,918,437.
Teitel, Sidney: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,919,322.
Tekko Corporation: *See—*
Kersten, Herbert H., 3,918,604.
Telang, Yeshwant P.; and Uy, James C., to Ford Motor Company. Wear-resistant coating for rotary engine side housing and method of making. 3,918,137, Cl. 29-156.4WL.
Telic Corporation: *See—*
Penfold, Alan S., 3,919,678.
Teller, Aaron Joseph, to Teller Environmental Systems, Inc. Abatement and selective recovery of acid gas emissions. 3,919,392, Cl. 423-240.000.
Teller Environmental Systems, Inc.: *See—*
Teller, Aaron Joseph, 3,919,392.
Tellier, Pierre: *See—*
Schirmann, Jean-Pierre; Tellier, Pierre; Mathais, Henri; and Weiss, Francis, 3,919,256.
Tempero, Robert L., to TransFresh Corporation. Apparatus for preservative storing and transportation of produce. 3,918,357, Cl. 99-646.00R.
Templer, David A.: *See—*
Levy, Jerome F.; Alps, Hugo A.; Alderman, Michael L.; and Templer, David A., 3,919,451.
Templin, Lawrence R., to Hughes Aircraft Company. Phase sensor circuit. 3,919,643, Cl. 325-150.000.
Teplyakov, Dmitry Ivanovich: *See—*
Zakhidov, Romen Abdullaevich; and Teplyakov, Dmitry Ivanovich, 3,918,303.
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, to Takeda Chemical Co., Ltd. Intermediates for producing cephalosporins. 3,919,207, Cl. 260-243.00C.
Termet, Pierre. Safety device for seal fixing apparatus. 3,918,619, Cl. 227-8.000.
Terrell Corporation, The: *See—*
Cooper, Henry E., III; and Gendreau, Edward E., 3,918,182.
Terrier, Francois: *See—*
Rothe, Hans-Jochen; Oxley, John H.; and Terrier, Francois, 3,919,288.
Tetra Pak Development SA: *See—*
Stark, Sven Olof Soren; Olsen, Jan-Erik; and Soukup, Franz, 3,918,237.
Tetzlaff, Roger W., to Norton Company. Injection molding machine. 3,918,870, Cl. 425-251.000.
Texaco Development Corporation: *See—*
Reynolds, Blake, 3,919,113.
Reynolds, Blake, 3,919,114.
Texaco Inc.: *See—*
Howlett, Donald L.; Godsey, Ernest E.; and Martin, Carl R., 3,919,657.
Knifton, John F., 3,919,272.
Texas Instruments Incorporated: *See—*
Barton, Troyce D., 3,919,625.
Bynum, Byron G., 3,919,537.
Cochran, Michael J.; and Grant, Charles P., Jr., 3,919,532.
Cochran, Michael J.; and Grant, Charles P., Jr., 3,919,536.
Kingma, Geoffrey W., 3,919,679.
Morgan, Ian H., 3,918,996.
Textron, Inc.: *See—*
Johnson, Glenn E.; and Lufkin, Martin H., 3,918,836.
Theil, Sven Erich, to F. L. Smidth & Co. Cooler system for rotary kiln and method. 3,918,891, Cl. 432-18.000.
Theodore, Ares N.: *See—*
Gordon, Scott C.; and Theodore, Ares N., 3,919,337.
Labana, Santokh S.; and Theodore, Ares N., 3,919,345.
Thettu, Raghulinga R., to Xerox Corporation. Contact fusing apparatus for fixing toner images to a support member. 3,918,397, Cl. 118-60.000.
Thiel, Max; Friebe, Walter-Gunar; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, to Boehringer Mannheim G.m.b.H. Certain 6-piperazinoalkylaminopurines. 3,919,226, Cl. 260-252.000.
Thiel, Max: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, 3,919,200.
Thiele, Frederick W.: *See—*
Westlake, Robert A.; and Thiele, Frederick W., 3,918,940.
Thiokol Corporation: *See—*
Villa, Jose L., 3,919,147.
Thompson, James Edwin, to Procter & Gamble Company, The. Built detergent compositions containing dextrin esters of poly carboxylic acids. 3,919,107, Cl. 252-99.000.
Thompson, Peter Charles; and Bowbeer, Thomas Aisbitt, to British Titan Limited. Process for production of pigmentary titanium dioxide. 3,919,388, Cl. 423-69.000.
Thomson-Brandt: *See—*
Bricot, Claude; Lacotte, Jean-Pierre; Le Carvennec, Francois; Lehureau, Jean-Claude; and Le Merer, Jean-Pierre, 3,919,698.
Thomson-CSF: *See—*
Galves, Jean-Pierre; and Merloz, Pierre, 3,919,584.
Hartemann, Pierre, 3,919,669.
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,919,686.
Thore, Thomas J., to Glenoit Mills, Inc. Sliver feeding means for high pile fabric knitting machines. 3,918,273, Cl. 66-9.00B.
Thorn Electrical Industries Limited: *See—*
Coaton, James Richard; and Rees, John Michael, 3,919,578.
Thorpe, Richard M., to A. H. Robins Company, Incorporated. Cantilever-type display units. 3,918,668, Cl. 248-205.00A.
Tigner, Reuben A., to Dow Chemical Company, The. Manufacture of resinous compositions having high electroconductivity. 3,919,122, Cl. 252-512.000.
Tilford, Baxter L., to Monsanto Company. Process for making and using sodium benzoate-caffeine compositions. 3,919,431, Cl. 426-190.000.
Tippett, Daniel R.; and Fricker, David C., to ECC Corporation. Battery charge control circuit. 3,919,617, Cl. 320-39.000.
Tisdale, Henry F.: *See—*
Vircks, Robert M.; and Tisdale, Henry F., 3,918,662.
Tobias, John D. Valve construction. 3,918,493, Cl. 137-625.230.
Tokico Ltd.: *See—*
Hayashida, Yoshihiro, 3,918,765.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Itamura, Einoshin; and Iinuma, Kazuhiro, 3,919,683.
Kurokawa, Akira; and Kojima, Tadashi, 3,919,641.

Sugiyama, Satoshi; and Ariga, Yoshio, 3,918,704.

Tokyo Tanabe Co., Ltd.: *See—*
Kiuchi, Akira; and Tanaka, Yuji, 3,919,049.

Tomco, Inc.: *See—*
Byers, James Otto, Jr., 3,918,496.

Tominaga, Michiaki: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, 3,919,239.

Tonooka, Hidenori: *See—*
Kawano, Michitada; Ito, Hideo; Jimbo, Tadashi; Tonooka, Hidenori; Okuni, Tetsuo; and Fukasu, Shunichi, 3,918,627.

Toriyama, Haruhiko: *See—*
Makino, Takayuki; and Toriyama, Haruhiko, 3,918,294.

Torkret GmbH, Firma: *See—*
Schurenberg, Rudi, 3,918,849.

Torn, Lawrence J.; and Cammarota, David F., to Redyref-Pressed & Welded, Inc. Directory assembly. 3,918,672, Cl. 248-447.000.

Torpie, John D., to Xerox Corporation. Time dependent two-to-three level alternate encoding. 3,919,476, Cl. 178-68.000.

Torresdal, David N. Multi-channel digital clock. 3,918,250, Cl. 58-23.00R.

Toshimitsu, Itaru; Fujii, Sakumi; and Nakajima, Taketoshi, to Toy Soda Manufacturing Co., Ltd. Phosphoric acid purification. 3,919,396, Cl. 423-321.000.

Toth, Charles, to Applied Aluminum Research Corporation. Method for the production of aluminum. 3,918,960, Cl. 75-68.00B.

Totten, Floyd M.: *See—*
Grimm, Donald K.; and Totten, Floyd M., 3,919,706.

Toumani, Rouben, to Bell Telephone Laboratories, Incorporated. Syllabic compandor. 3,919,654, Cl. 330-29.000.

Towmotor Corporation: *See—*
Despain, James E., 3,919,689.

Toy, Arthur D. F.: *See—*
Jaffe, Fred; and Toy, Arthur D. F., 3,919,269.

Toy Soda Manufacturing Co., Ltd.: *See—*
Toshimitsu, Itaru; Fujii, Sakumi; and Nakajima, Taketoshi, 3,919,396.

Toyo Kogyo Co., Ltd.: *See—*
Hirose, Yutaka; and Yoshimura, Shigetake, 3,918,257.

Toyo Tire Cord Company Limited: *See—*
Matsumura, Sakujiro; Yamamura, Tadashi; Ogura, Akira; and Hayashi, Masataka, 3,918,245.

Toyoda, Takeshi: *See—*
Toyoshima, Shigeshi; Kanao, Seizo; Toyoda, Takeshi; and Suyama, Tadashi, 3,919,291.

Toyoshima, Shigeshi; Kanao, Seizo; Toyoda, Takeshi; and Suyama, Tadashi, to Ajinomoto Co., Inc. N-ethylcarbaminomethylisoleucine. 3,919,291, Cl. 260-482.00C.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Imaizumi, Kenichi, 3,918,858.
Makino, Takayuki; and Toriyama, Haruhiko, 3,918,294.

Trans-Can Industries, Inc.: *See—*
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerard, 3,918,307.

Transcodan: *See—*
Forberg, Hans-Jurgen, 3,918,675.

TransFresh Corporation: *See—*
Tempero, Robert L., 3,918,357.

Transilwrap Company, Inc.: *See—*
Drower, Herbert M.; and Korinek, Robin, 3,918,188.

Transkrit Corporation: *See—*
Neubauer, Frank H., 3,918,632.

Trask, John B., Jr. Golf club swing training device and method. 3,918,721, Cl. 273-186.00A.

Traub, Hermann: *See—*
Durst, Roland; and Schweizer, Kurt, 3,918,594.

Treadway, Ronald L.: *See—*
Millhollan, Michael S.; and Treadway, Ronald L., 3,919,566.

Trepanier, Donald L.; and Sunder, Shyam, to Dow Chemical Company, The. 3-(2-Acylaminophenyl)-1,2,4-triazines. 3,919,215, Cl. 260-248.0AS.

Trepanier, Donald L.; and Sunder, Shyam, to Dow Chemical Company, The. 6-(Alkyl)-3,4,6,7-tetrahydro-1,2,4-triazinoquinazolines. 3,919,216, Cl. 260-248.0AS.

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Treptow, Arnold W.: *See—*
Smith, Baynard R.; and Treptow, Arnold W., 3,918,980.

Treuhaft, Martin B.; and Wood, Charles D., III, to PPG Industries, Inc. Lead trap. 3,918,944, Cl. 55-337.000.

Treuhaft, Martin B.: *See—*
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,937.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,943.

Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Dithiocarbonylthioacetyl cephalosporin derivatives. 3,919,205, Cl. 260-243.00C.

Tri-tech, Inc.: *See—*
Haydon, Arthur W., 3,918,252.

Triple "A" Accessories, Inc.: *See—*
Lim, Eui Joon, 3,918,096.

Trivette, Chester D., Jr.; Vanderkooi, John P.; and Genetti, Ralph A., to Monsanto Company. Accelerator combinations comprising thioperoxydiphosphate and bis (triazinyl) disulfides. 3,919,132, Cl. 260-5.000.

Troitsky, Andrian Petrovich: *See—*
Kotelnikov, Georgy Romanovich; Bednov, Stanislav Fedorovich; Sirotkin, Boris Vasilievich; Bushin, Alexandr Nikitich; Buyanov, Roman Alexeevich; Strunnikova, Ljudmila Viktorovna; Andrushkevich, Mikhail Mikhailovich; Karnaev, Nikolai Alexandrovich; Troitsky, Andrian Petrovich; Kirnos, Yakov Yakovlevich; Ivanitskaya, Tamara Mikhailovna; Shishkin, Alexandr Nikolaevich; Ponomarenko, Vladimir Ivanovich; Eremenko, Nickolai Yakovlevich; Dultsev, Vadim Alexandrovich; Liakumovich, Alexandr Grigorievich; Stepanov, Gennady Arkadievich; and Sobolev, Valerian Mikhailovich, 3,919,116.

Trosken, Otto: *See—*
Hintermeier, Karl; Trosken, Otto; and Wirth, Siegfried, 3,919,319.

Trosset, Daniele: *See—*
Fresnel, Jean Marie; and Trosset, Daniele, 3,919,052.

Trotter, Robert Michale. Tire changing apparatus. 3,918,509, Cl. 157-1.240.

Troy, Joseph C.: *See—*
Peck, David F.; and Troy, Joseph C., 3,919,086.

Trusselle, William H., to Pneumatic Scale Corporation. Control for filling machine. 3,918,475, Cl. 141-128.000.

TRW Inc.: *See—*
Miller, Laurence L., 3,918,856.
Parker, Ralph L., 3,918,569.

Tsen, Cho C.; and Hoover, William J., to Kansas University Research Foundation, The. Shortening sparing process for chemically leavened baked and fried products and compositions for preparing the same. 3,919,434, Cl. 426-553.000.

Tsuchiya, Shiro: *See—*
Shindo, Masatoshi; Tsuchiya, Shiro; and Takegami, Kazuo, 3,918,892.

Tsushima, Susumu: *See—*
Terao, Shinji; Matsuo, Taisuke; Tsushima, Susumu; Miyawaki, Toshio; and Matsumoto, Norichika, 3,919,207.

Tucker, Grant C.: *See—*
Bradshaw, Don L., 3,918,264.

Tuffias, Robert H., to Litton Systems, Inc. Magnetic field responsive hydrodynamic bearing. 3,918,773, Cl. 308-10.000.

Tulagin, Vesvolod: *See—*
Krohn, Ivar T.; Page, Geoffrey A.; and Tulagin, Vesvolod, 3,918,967.

Tung, Chin: *See—*
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 3,919,701.

Tung, Chung C., to Hewlett-Packard Company. Circulating shift register memory having editing and subroutining capability. 3,919,694, Cl. 340-172.500.

Turenne, Charles A.: *See—*
Schmitz, Alfred E., 3,918,133.

Turner, Don La Viere. Slingshot. 3,918,427, Cl. 124-20.00B.

Tyco Laboratories, Inc.: *See—*
Blincow, Donald W., 3,919,551.

Tyler, Reginald E. W.; and Carter, Paul M., to Durand Machine Company Limited. Separating apparatus for flat pieces of different dimensions. 3,918,586, Cl. 209-74.00R.

U-S Safety Trolley Corporation: *See—*
Ross, Donald R., Sr., 3,918,557.

Uchida, Hiroshi, to Murata Kikai Kabushiki Kaisha. Method and device for readying of yarn ends, particularly in yarn-winding machines. 3,918,651, Cl. 242-35.60R.

Uchida, Kozo: *See—*
Suko, Shoichi; Uchida, Kozo; and Tamada, Seiichi, 3,919,601.

Uddeholms AB: *See—*
Oberg, Karl Erik, 3,918,692.

Ueda, Hiroshi: *See—*
Yata, Kotaro; and Ueda, Hiroshi, 3,919,538.

Ueda, Yasuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.

Ueno, Sadayasu; and Hosho, Yukio, to Hitachi, Ltd. Temperature detector head. 3,919,680, Cl. 338-28.000.

Uetrecht, Dale M., to D. H. Baldwin Company. Voltage-controlled filter. 3,919,648, Cl. 328-167.000.

Uhrig, Heinz: *See—*
Grossmann, Max; Faber, Ruth; and Uhrig, Heinz, 3,919,429.

Ulichny, Robert M., to Ladish Co. Hammer forging die. 3,918,290, Cl. 72-481.000.

Ullmann, Werner; Schumacher, Bernd; Marti, Peter; and Vasalli, Caspar, to AG fur Industrielle Elektronik AGIE Losone b. Locarno. Motion translation mechanism for the tool drive of a machining equipment. 3,919,516, Cl. 219-69.00E.

Union Carbide Corporation: *See—*
Bowen, James Harold; and Flowers, Edward, 3,919,635.
Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., 3,919,163.
Nausedas, Joseph A., 3,918,589.
Park, Kisoon, 3,919,097.
Schulz, David A., 3,919,376.
Singer, Leonard S., 3,919,387.
Smarook, Walter H., 3,919,378.
Smarook, Walter H., 3,919,379.
Smarook, Walter H.; and Sonia, John, 3,919,380.
Smarook, Walter H., 3,919,381.

Smarook, Walter H., 3,919,382.
Smarook, Walter H., 3,919,445.
Smarook, Walter H., 3,919,446.
Taller, Robert Arthur, 3,919,174.

Union Siserurgique du Nord et de l'Est de la France par abreviation "USINOR": *See—*
Volat, Jean-Pierre, 3,919,518.

United Merchants and Manufacturers, Inc.: *See—*
Fischer, Adolf A., 3,919,153.

United States Gypsum Company: *See—*
Hauge, Douglas O., 3,919,395.
Long, William Joseph, 3,918,981.

United States of America
Agriculture: *See—*
Elliger, Carl A.; Waiss, Anthony C., Jr.; and Booth, Albert N., 3,919,432.
Kullman, Russel M.; and Reinhardt, Robert M., 3,918,903.
Perkins, Rita M.; Cooper, Albert S., Jr.; Calamari, Timothy A., Jr.; Moore, Harry B.; and Schreiber, Sidney P., 3,919,439.
Perrier, Dorothy M.; and Benerito, Ruth R., 3,918,899.
Rothman, Edward S.; and Moore, Gordon G., 3,919,275.
Army: *See—*
Allen, Floyd, 3,919,642.
Hydro, William R., 3,919,243.
Sommer, Harold Z.; and Miller, Jacob I., 3,919,241.
Sommer, Harold Z.; and Krenzer, John, 3,919,289.
Ziegler, William H., 3,918,346.
Energy Research and Development Administration: *See—*
Blackwell, Bennie F.; Feltz, Louis V.; and Maydew, Randall C., 3,918,839.
Crisler, Larry R., 3,919,273.
Crisler, Larry R., 3,919,274.
Giles, Paul M., 3,918,818.
Grimes, Warren R.; and Bamberger, Carlos E., 3,919,406.
Holm, Dale M., 3,918,812.
Inouye, Henry; and Liu, Chain T., 3,918,965.
Maffei, Hector P.; and Borisch, Ronald R., 3,918,961.
Mooney, Leonard J.; and Hyatt, Hugh M., 3,919,580.
Environmental Protection Agency: *See—*
Dawson, Walter F., 3,918,636.
Interior: *See—*
Moore, Raymond H., 3,919,390.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Bottoms, Donald J.; and Gavrillis, Theofanis G. Turnstile and flared cone UHF antenna. 3,919,710, Cl. 343-770.000.
Weber, Leonard. Prevention of hydrogen embrittlement of high-strength steel by hydrazine compositions. 3,919,014, Cl. 149-36.000.
Navy: *See—*
Dugan, Martin F.; and Bowlus, Daniel A., 3,918,859.
Few, Arthur A., 3,919,636.
McBride, William R.; Finnegan, William G.; and Adicoff, Arnold, 3,919,012.
Milton, A. Fenner, 3,918,794.
Schneider, William E., 3,918,498.
Shaw, Bevil J.; and Miller, Richard P., 3,918,100.
Talkington, Howard R., 3,918,113.
Transportation: *See—*
Abernethy, Charles N., III; and Iannini, Americo A., 3,918,176.
Veterans Administration: *See—*
Mauch, Hans A.; and Smith, Glendon, 3,918,179.

U.S. Philips Corporation: *See—*
Arlman, Jan Jacob, 3,918,909.
Beyer, Lutz, 3,918,867.
Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, 3,919,470.
Bok, Johannes Gerardus; and Witterick, Petrus Johannes Julius, 3,918,884.
Bol, Arie; van Ginkel, Johannes; Van Der Schoot, Andrianus Henricus Maria; and Swaanen, Petrus Henricus, 3,918,151.
Hasker, Jan; and De Klerr, Jacobus Johannes Maria Joseph, 3,919,583.
Holman, Benedictus Timotheus Johannes, 3,919,586.
Horster, Horst; Pusschert, Walter Alfred; Schweppe, Heinz; and Czarnojan, Wolfram, 3,919,570.
Kasperkovitz, Wolfdietrich Georg, 3,919,469.
Maria Bertens, Theodorus Cornelius Johannes, 3,919,066.
Morrien, Albertus Marinus, 3,919,652.
Remery, Michel; and Souvay, Andre, 3,919,590.
Van Der Laan, Jan, 3,918,882.

United States Steel Corporation: *See—*
Heard, Allen C., 3,918,845.
Shapiand, Earl P., Jr., 3,918,613.
Williamson, Donald J., 3,918,279.

United Technologies Corporation: *See—*
Caruolo, Antonio B.; Davis, Jack W.; and Walch, Allen P., 3,919,663.
Felten, Edward J., 3,918,139.
McComas, Charles C., 3,918,925.
Shuttleworth, Richmond G.; and Williams, Donald L., 3,918,832.
Yamarik, George J.; and Craig, Harold M., 3,918,835.

Unitron Incorporated: *See—*
Gillett, Jimmie D., 3,919,610.

Universal Modular Structures, Inc.: *See—*
Edwards, Lindell N., 3,918,232.

Universal Oil Products Company: *See—*
Arnold, Robert J.; and Gattuso, Marion J., 3,919,225.
Bloch, Herman S., 3,919,299.
Forbes, James T.; and Gantt, James E., 3,918,930.
Gatsis, John G., 3,919,074.
Germanas, Dalia; and Pollitzer, Ernest L., 3,919,341.
Hayes, John C., 3,919,340.
Michalko, Edward, 3,919,117.
Sobel, Jay E.; and Anderson, Robert F., 3,919,343.
Stine, Laurence O.; and Conner, Algie J., 3,919,115.

University Court of the University of Edinburgh, The: *See—*
Jones, Robert L., 3,919,287.

Upjohn Company, The: *See—*
Axen, Udo F., 3,919,285.
Bundy, Gordon L.; and Pike, John E., 3,919,286.
Lednicer, Daniel, 3,919,327.
Pike, John E.; and Schneider, William P., 3,919,293.

Upton, Albert E., Jr., to Scott & Fetzer Company, The. Awning and brackets and extrusion method therefor. 3,918,511, Cl. 160-67.000.

Ura, Yasukazu; Mori, Yoshiharu; Sakata, Gojyo; Takamatsu, Hideki; and Kondo, Keiichi, to Nissan Chemical Industries, Ltd. Process for preparing poly(sulfonyl-phenylene)phenylphosphonate. 3,919,363, Cl. 260-973.000.

Urban, Michael J., to GTE Laboratories. Bubble domain detector contact. 3,919,055, Cl. 204-38.00B.

Urkevich, M. P., to General Electric Company. Method of coating using a silicone modified polyester. 3,919,438, Cl. 427-54.000.

Urton, John T.: *See—*
Glass, Max E.; Donahue, Stephen F.; Urton, John T.; and Carlson, Arthur, Jr., 3,919,411.

Usami, Hiroshi; Kohari, Katsuo; and Ishida, Hiroshi, to Fujitsu Ltd.; and Fujitsu Fanuc Limited. System for driving a pulse motor. 3,919,608, Cl. 318-138.000.

Ushio, Sunao: *See—*
Takebe, Saburo; Abe, Toshizo; Goko, Nobuaki; Ushio, Sunao; and Go, Shigeo, 3,919,185.

Usugi, Kikuo: *See—*
Nonaka, Hiroshi; Usugi, Kikuo; Okada, Masataka; and Iwasaki, Shoji, 3,918,716.

Utilco Company, The: *See—*
Pyles, Manuel A., 3,918,684.

Utsunomiya, Kimitake: *See—*
Okada, Takashi; and Utsunomiya, Kimitake, 3,919,567.

Uy, James C.: *See—*
Telang, Yeshwant P.; and Uy, James C., 3,918,137.

Uyeda, Tim M.: *See—*
Gartner, Klaus W.; and Uyeda, Tim M., 3,918,371.

Valdespino, Joseph M. Food lift. 3,918,116, Cl. 15-3.130.

Valint, Paul L.: *See—*
Oswald, Alexis A.; and Valint, Paul L., 3,919,129.

Van Damme, Joseph, to Foxboro Company, The. Guide assembly with thin wall insert. 3,918,772, Cl. 308-4.00R.

Vanderkooi, John P.: *See—*
Trivette, Chester D., Jr.; Vanderkooi, John P.; and Genetti, Ralph A., 3,919,132.

Van Der Laan, Jan, to U.S. Philips Corporation. Flash lamp unit. 3,918,882, Cl. 431-92.000.

VanderMeer, Richard H.; and Simmons, Robert L., to Goldco, Industries Inc. Method for positioning and orienting palletized articles. 3,918,598, Cl. 214-152.000.

van der Ploeg, Frederik, to Wavin B.V. Apparatus for automatically feeding a number of extruders from a number of supply containers. 3,918,869, Cl. 425-190.000.

Van Der Schoot, Andrianus Henricus Maria: *See—*
Bol, Arie; van Ginkel, Johannes; Van Der Schoot, Andrianus Henricus Maria; and Swaanen, Petrus Henricus, 3,918,151.

van der Werff, Bartele, to A Vuyk & Zonen's Scheepsverven B.V. Bottom-dump vessels. 3,918,381, Cl. 114-29.000.

Van Fossen, Harvey, to Wheelabrator-Frye Inc. Apparatus for finishing parts. 3,918,212, Cl. 51-163.000.

van Ginkel, Johannes: *See—*
Bol, Arie; van Ginkel, Johannes; Van Der Schoot, Andrianus Henricus Maria; and Swaanen, Petrus Henricus, 3,918,151.

Van Leeuwen, Roger A. Filter cap for drain valves. 3,918,483, Cl. 137-550.000.

Van Ness, Bradford O.: *See—*
Hunting, Robert A.; and Van Ness, Bradford O., 3,919,461.

Van Steenhoven, Frank, to Westinghouse Electric Corporation. Luminaire ballast mounting system. 3,919,459, Cl. 174-63.000.

van Wely, Francois Prick: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, 3,918,805.

Vartiak, Joseph F., to Nalco Chemical Company. Controlling evaporation of water. 3,918,904, Cl. 21-60.50A.

Vasalli, Caspar: *See—*
Ullmann, Werner; Schumacher, Bernd; Marti, Peter; and Vasalli, Caspar, 3,919,516.

Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, to Champion International Corporation. Colored organic synthetic pigments and method for producing same. 3,919,110, Cl. 252-316.000.

Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,919,246.

Vattuone, Evor S., to Singer Company, The. Multiple addend adder and multiplier. 3,919,535, Cl. 235-164.000.
VCA Corporation: *See—*
Steiman, Wolf, 3,918,614.
Veb Polygraph Leipzig Kombinat Fuwe Polygraphische Maschinen und Ausruestungen: *See—*
Bottcher, Winfried, 3,919,019.
Veba Chemie AG: *See—*
Schmitt, Karl; Disteldorf, Josef; and Schmitt, Felix, 3,919,218.
Vedenkov, Viktor Grigorievich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.
Vennard, William O.; and Wright, Jack C., to Ethyl Corporation. Method for birth control. 3,918,443, Cl. 128-130.000.
Venus Scientific Inc.: *See—*
Cohen, David A., 3,918,810.
Verduzco, Miguel A.; and Dally, James W., to LaSalle Steel Company. Die. 3,918,288, Cl. 72-467.000.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Despalmes, Friedrich, 3,918,682.
Prokesch, Albin, 3,918,504.
Vida, Julius A.; and Samour, Carlos M., to Kendall Company, The. Therapeutic compositions containing 1-methyl-3-alkoxymethyl-5,5-disubstituted barbituric acid compounds. 3,919,427, Cl. 424-254.000.
Vidic, Hans-Jorg; and Kieslich, Klaus, to Schering Aktiengesellschaft. Microbiological hydroxylation of 2,6-methano-3-benzazocines. 3,919,047, Cl. 195-51.00R.
Vidrio, Horacio, to Miles Laboratories, Inc. Method of producing vasodilation using certain 3-substituted-quinazoline derivatives. 3,919,425, Cl. 424-251.000.
Villa, Jose L., to Thiokol Corporation. Abietate modified polysulfide polymers and other resins as adhesive additives for liquid polysulfide polymer based adhesive compositions. 3,919,147, Cl. 260-26.000.
Villani, Frank J., to Schering Corporation. Novel 1-N-(α-aminoacetyl) aminoadamantanes. 3,919,313, Cl. 260-558.00A.
Villaume, Henry F., to Howell Laboratories, Incorporated. Apparatus for purging ejecting pin cavities. 3,918,868, Cl. 425-169.000.
Villella, Tony R. Internal combustion engine. 3,918,420, Cl. 123-75.00C.
Villemer, Jean; and Landwerlin, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Drive device for holding paper on a rotating drum. 3,918,707, Cl. 271-277.000.
Vincent, Thomas C.: *See—*
Kauders, Herbert J.; and Vincent, Thomas C., 3,919,109.
Vircks, Robert M.; and Tisdale, Henry F., to Boeing Company, The. Localizer lateral guidance control system. 3,918,662, Cl. 244-77.00A.
Vitta Corporation: *See—*
Ettre, Kitty S.; Castles, George Richard; and Petrikas, Aloyzas, 3,919,452.
Vittore, Lorenzo: *See—*
Coraluppi, Enzo; de Saraca, Elio; and Vittore, Lorenzo, 3,918,975.
Vlk, Jaroslav: *See—*
Ott, Helmut; and Vlk, Jaroslav, 3,918,429.
Vock, Richard C., to Xerox Corporation. Corona transfer mechanism. 3,918,403, Cl. 118-637.000.
Vockenhuber, Karl: *See—*
Bauhofer, Friedrich, 3,918,801.
Vofsi, David; and Asscher, Meir, to Pechiney-Saint-Gobain. Production of chlorinated cotelomers. 3,919,292, Cl. 260-486.00H.
Vogel, Jay Forrest: *See—*
Lemke, Timothy Allen; and Vogel, Jay Forrest, 3,918,784.
Vogele, Josef, to Hebel Gasbetonwerk GmbH. Process for the production of building elements from porous concrete. 3,919,372, Cl. 264-82.000.
Vogele, Robert E., to Environmental Graphic Systems, Inc. Sign assembly. 3,918,187, Cl. 40-156.000.
Vogeli, I. Ernst. Method for forming a packing container. 3,918,353, Cl. 93-37.0SP.
Volat, Jean-Pierre, to Union Siserurgique du Nord et de l'Est de la France par abreviation "USINOR". Device for labelling objects such as blooms. 3,919,518, Cl. 219-80.000.
Volk, John A.: *See—*
Dukich, Peter P.; Lechevalier, Robert L.; and Volk, John A., 3,919,475.
Volker, Theodor; Hering, Klaus; and Dallwigk, Edouard, to Lonza Ltd. Process for the production of hydroquinolines. 3,919,236, Cl. 260-283.00R.
Volkov, Mstislav Vasilievich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.
Volkov, Sergei Mikhailovich: *See—*
Nikolaev, Georgy Alexandrovich; Loschilov, Vladimir Ivanovich; Volkov, Sergei Mikhailovich; Vedenkov, Viktor Grigorievich; Leonichev, Valery Dmitrievich; Polyakov, Valentin Alexandrovich; and Volkov, Mstislav Vasilievich, 3,918,442.
Volkswagenwerk Aktiengesellschaft: *See—*
Gaschler, Erich, 3,918,258.
Hattwig, Peter; and Munchenberg, Gunter, 3,918,553.
Reinhold, Norbert; and Berg, Horst, 3,918,316.
Volle, Rene: *See—*
Pierre, Bernard; Volle, Rene; and Simon, Georges, 3,918,347.
vom Berg, Hugo; and Schalmath, Heinz, to Jungheinrich Unternehmensuerwaltung KG. Sweeping machine. 3,918,118, Cl. 15-83.000.
Vomel, Wolfgang: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, 3,919,200.
von der Eltz, Hans-Ulrich; Lehinant, Armand; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the single-bath dyeing of unmodified polyolefin fibers with metal-containing phthalocyanine. 3,918,897, Cl. 8-62.000.
von Gizycki, Ulrich; Oertel, Gunter; Beck, Guenther; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Heterocyclic isocyanates containing two ring nitrogen atoms. 3,919,228, Cl. 260-256.40N.
Vornberger, Walter, to International Shoe Machine Corporation. Machine for cement lasting. 3,918,394, Cl. 118-7.000.
Vosper Thornycroft Limited: *See—*
Dyke, Raymond William, 3,918,548.
Voulgaris, Anthony, to Lawrence Peska Associates, Inc., a part interest. Solution of sun screening agent and insect repellent with dispensing bottle. 3,918,612, Cl. 222-144.500.
Vysoka skola chemicko-technologicka: *See—*
Kralicek, Jaroslav; Kubanek, Vladimir; and Kondelikova, Jaroslava, 3,919,175.
W. H. Porter, Inc.: *See—*
Porter, William H., 3,919,443.
W. R. Grace & Co.: *See—*
Lundquist, Joseph Theodore, Jr.; and Giner, Jose D., 3,919,062.
Palmer, Nigel Innes; Sugarman, Nathan; and Grammer, Don O'Neil, 3,918,995.
Pullen, Joseph B.; and Mobley, Burton L., 3,919,403.
W.S. Shamban & Co.: *See—*
Dryer, Eldon O., 3,918,725.
WABCO Westinghouse G.m.b.H.: *See—*
Klatt, Alfred, 3,918,766.
Reinecke, Erich, 3,918,767.
Wacan Hydro-Flow Ltd.: *See—*
Posgate, Edward S., 3,918,817.
Wadia, Gurinder S.; and Gill, Harnek S., to McGraw-Edison Company. Electric cooking apparatus with safety control. 3,919,523, Cl. 219-494.000.
Waenerlund, Torsten Goran Emil. to Granges Essem Aktiebolag. Aluminum furnace charging methods. 3,919,058, Cl. 204-67.000.
Wagner, Robert J., to Allis-Chalmers Corporation. Cable controlled draft load and position sensing linkage. 3,918,527, Cl. 172-9.000.
Wahl, Donn A.: *See—*
Field, Robert G.; and Wahl, Donn A., 3,919,690.
Wahl, John F.; and Meyer, Roy E., to Wall Clipper Corporation. Cordless electric ignition tool. 3,919,522, Cl. 219-268.000.
Waiss, Anthony C., Jr.: *See—*
Elliger, Carl A.; Waiss, Anthony C., Jr.; and Booth, Albert N., 3,919,432.
Wakabayashi, Yasuo. Digital world clock. 3,918,251, Cl. 58-42.500.
Walburg, Richard; Gerstenberg, Helmut; and Osterbrink, Hans, to Hoechst Aktiengesellschaft. Reactor for the preparation of halogenated compounds from hydrocarbons. 3,918,919, Cl. 23-290.000.
Walch, Allen P.: *See—*
Caruolo, Antonio B.; Davis, Jack W.; and Walch, Allen P., 3,919,663.
Walden, Robert Henry, to Bell Telephone Laboratories, Incorporated. Charge transfer logic gate. 3,919,564, Cl. 307-218.000.
Walding, Eugene C., to Oak Industries Inc. Pay TV system using UHF input. 3,919,463, Cl. 178-5.100.
Walker, Douglas W.: *See—*
Gillman, Leland M.; and Walker, Douglas W., 3,918,989.
Walker, Ray A., to Battelle Development Corporation, The. Data record tracking using track identifying information in the gaps between recorded data groups. 3,919,697, Cl. 340-173.00R.
Walker, Richard Marion: *See—*
Posner, Ronald Sheldon; and Walker, Richard Marion, 3,919,666.
Wall Clipper Corporation: *See—*
Wahl, John F.; and Meyer, Roy E., 3,919,522.
Wallace, Alan D. Container for soaking and preserving paint brushes and paint roller covers. 3,918,582, Cl. 206-362.000.
Wallace, Alec: *See—*
York, Herbert; Young, Bryan; and Wallace, Alec, 3,918,274.
Wallace, Goerge T. Mooring device. 3,918,385, Cl. 114-230.000.
Wallis, Craig. *See—*
Melnick, Joseph L.; and Wallis, Craig, 3,919,044.
Walser, Ronald D.; and Edmisson, Jerry L., to Missouri Farmers Association, Inc. Display rack. 3,918,588, Cl. 211-49.000.
Walt Disney Productions: *See—*
Nater, Robert A.; Rolston, Charles E.; Hoover, Edward D.; Gunning, William F.; and King, Robert P., 3,919,696.
Walter, Leo; and Greul, Helmut W., to Electronics Stamping Corporation. Bus clip and bus strip. 3,918,788, Cl. 339-19.000.
Wankel, Felix: *See—*
Eiermann, Dankwart; and Wankel, Felix, 3,918,413.
Wankel GmbH: *See—*
Eiermann, Dankwart; and Wankel, Felix, 3,918,413.
Ward, David Henry, to Ward School Bus Mfg., Inc. School bus invalid lift. 3,918,596, Cl. 214-75.00R.
Ward School Bus Mfg., Inc.: *See—*
Ward, David Henry, 3,918,596.
Warfel, Mark. Horseshoeing nail. 3,918,344, Cl. 85-12.000.

Warnant, Julien; and Jolly, Jean, to Roussel-UCLAF. Dienic derivatives of the androstane series and process. 3,919,198, Cl. 260-239.550.

Warnant, Julien; and Jolly, Jean, to Roussel-UCLAF. 13β-ethyl-17α-methyl-18,19-dinor-$\Delta^{4,9}$-pregnadiene-3,20-dione. 3,919,267, Cl. 260-397.300.

Warner-Lambert Company: *See*—
Herrmann, Wolfgang Dieter; Stoss, Peter Johannes; and Satzinger, Gerhard, 3,919,310.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,138.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,139.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,919,357.
Sircar, Jagadish C.; and Zinnes, Harold, 3,919,203.

Warner & Swasey Company, The: *See*—
Wespi, George E., 3,919,614.

Warnock, Emmit F.; Williamson, Bobby Wayne; Ellington, Gordon H.; and Mitchell, William O., to Oxford Industries, Inc. Method for finishing over-cut pattern pieces. 3,918,335, Cl. 83-19.000.

Warrach, Wolfgang, to Stein, Hall, Limited. Method of bonding styrene-butadiene block copolymers to other surfaces. 3,919,035, Cl. 156-315.000.

Warren, Bert; Crosby, Gordon, Jr.; and Evans, George L., to Biological Corporation of America. Diagnostic test for the determination of sickling hemoglobinopathies. 3,918,905, Cl. 23-230.00B.

Warren Pumps, Inc.: *See*—
Korzec, Walter Anthony, 3,918,829.

Waske, George F. Trap closure. 3,918,194, Cl. 43-61.000.

Watanabe, Akinori: *See*—
Kameyama, Tadao; and Watanabe, Akinori, 3,918,552.

Watanabe, Isao: *See*—
Yamaguchi, Tadashi; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,919,178.

Watanabe, Tadashi: *See*—
Iwasawa, Maozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,352.
Iwasawa, Naozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,350.

Watanabe, Teruji: *See*—
Oshima, Shintaro; Watanabe, Teruji; and Fukui, Takasuke, 3,919,630.

Waters Associates: *See*—
Abrahams, Louis, 3,918,495.

Watson-Bowman Associates, Inc.: *See*—
Bowman, Thomas C., 3,918,824.

Watson, Donald, legal representative: *See*—
Hands, Clifford Henry George, deceased; Hands, Joan, legal representative; and Watson, Donald, legal representative, 3,919,054.

Wavin B.V.: *See*—
van der Ploeg, Frederik, 3,918,869.

Weber, Johannes; and Schneider, Wolfgang, to Robert Bosch G.m.b.H. Vibrator generator. 3,919,575, Cl. 310-81.000.

Weber, Karl-Heinz, to Weber Schraubautomaten GmbH & Co., KG. Screwdriver. 3,918,533, Cl. 173-155.000.

Weber, Leonard: *See*—
United States of America, National Aeronautics and Space Administration; and Weber, Leonard, 3,919,014.

Weber, Robert L. Infusion apparatus and method. 3,918,355, Cl. 99-283.000.

Weber, Ronald A.; Griffin, Zane L.; and Childers, Thomas W., to Exxon Production Research Company. Multiport subsea connector. 3,918,485, Cl. 137-594.000.

Weber Schraubautomaten GmbH & Co., KG: *See*—
Weber, Karl-Heinz, 3,918,533.

Webster Spring Co. Inc.: *See*—
Ramsey, Henry R., 3,918,473.

Wechsberg, Manfred; and Niederprum, Hans, to Bayer Aktiengesellschaft. Preparation of inorganic fluoride-free perfluoroalkane sulphonates. 3,919,295, Cl. 260-501.140.

Wechsberg, Manfred: *See*—
Roesky, Herbert Walter; Niederprum, Hans; and Wechsberg, Manfred, 3,919,301.

Wechsler, Reuben, to Motorola, Inc. Control system for inverter circuits. 3,919,621, Cl. 321-14.000.

Wehr Corporation: *See*—
Lambert, Robert R., 3,918,354.

Weidman, William K.: *See*—
Zimmer, George A.; Allaben, Charles M.; and Weidman, William K., 3,918,776.

Weimer, Paul Kessler, to RCA Corporation. Charge transfer circuits. 3,919,468, Cl. 178-7.100.

Weiner, Gerald H.: *See*—
Morgan, Ward; Weiner, Gerald H.; and Raff, Ronald D., 3,918,161.

Weiner, Richard J.: *See*—
Moon, Warren D.; Weiner, Richard J.; Hansen, Robert A.; and Linde, Robert N., 3,919,479.

Weiser/Robodyne Corporation: *See*—
Weiser, Sidney, 3,918,814.

Weiser, Sidney, to Weiser/Robodyne Corporation. Optical position sensor. 3,918,814, Cl. 356-156.000.

Weiss, Francis: *See*—
Schirmann, Jean-Pierre; Tellier, Pierre; Mathais, Henri; and Weiss, Francis, 3,919,256.

Weissman, Sydney Joseph. Clip primarily for T-bar ceilings. 3,918,234, Cl. 52-760.000.

Weisstuch, Aaron; and Schell, Charles E., III. Heat transfer measuring device. 3,918,300, Cl. 73-112.000.

Welch, Medard W. Method of playing golf under conditions of insufficient light. 3,918,719, Cl. 273-176.00R.

Welex Incorporated: *See*—
Nissel, Frank R., 3,918,865.

Wells, Johnny L., to Phillips Petroleum Company. Electroplating polypropylene. 3,918,927, Cl. 29-195.000.

Weltmer, Wilton W., to Allis-Chalmers Corporation. Nozzle for fluid injection. 3,918,491, Cl. 137-604.000.

Wendler, Norman L.: *See*—
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,919,253.

Wendt, Hans: *See*—
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.

Wentorf, Robert H., Jr.; and Rocco, William A., to General Electric Company. Catalyst systems for synthesis of cubic boron nitride. 3,918,219, Cl. 51-307.000.

Wernberg, Donald E., to Woodward Governor Company. Fuel control for a gas turbine having auxiliary air bleed. 3,918,254, Cl. 60-39.28R.

Werner, Dietmar: *See*—
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.

Werner, Walter F.: *See*—
Lindblad, Nero R.; and Werner, Walter F., 3,918,337.

Wespi, George E., to Warner & Swasey Company, The. Dual-cycle cam grinding machine with electrical pulse operated wheel feed. 3,919,614, Cl. 318-571.000.

West, Peter: *See*—
Hall, Richard H.; Haigh, Daniel H.; Archer, Wesley L.; and West, Peter, 3,919,335.

Western Electric Company: *See*—
Havranek, Drahomir F., 3,919,486.

Westinghouse Air Brake Company: *See*—
Bridigum, Robert J., 3,918,850.
Worbois, Robert J., 3,918,769.

Westinghouse Electric Corporation: *See*—
Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., 3,918,304.
Alliston, William H., 3,919,720.
Benedict, Robert P., 3,918,305.
Bratkowski, Walter V.; and Spewock, Metro, 3,919,676.
Burkhardt, Charles E.; and Ellis, Belvin B., 3,918,153.
Einolf, Charles W., Jr.; and Neuner, James A., 3,919,533.
Foster, Newton C.; and Smith, James D. B., 3,919,348.
Holden, Abe N., 3,918,255.
Kellogg, Walter J., 3,919,506.
Klein, Gerald I., 3,919,670.
Meacham, James H., 3,919,597.
Reid, James B., 3,919,043.
Reuther, John F., 3,919,623.
Roerty, Dennis F., 3,919,632.
Salvati, John G.; Ricci, Louis N.; and Clark, Thomas E., 3,919,603.
Spiessbach, Andrew J.; Parrish, William F.; and Kennedy, Paul G., 3,919,471.
Van Steenhoven, Frank, 3,919,459.
Wilcox, Harold D.; Griswold, Douglas A.; and Patel, Himanshu M., 3,919,108.

Westlake, Robert A.; and Thiele, Frederick W. Combined wet scrubber-clarifier unit. 3,918,940, Cl. 55-223.000.

Weston, David. Flotation of sulphide minerals from sulphide bearing ore. 3,919,079, Cl. 209-166.000.

Westran Corporation: *See*—
Dalton, Thomas B., 3,918,494.

Westvaco Corporation: *See*—
Forbes, Hampton E., Jr.; and LaFreniere, Lawrence J., 3,918,629.

Weyer, Hans-Jurgen: *See*—
Ong, Sienling; Diery, Helmut; and Weyer, Hans-Jurgen, 3,918,900.

Weyer, Rudi; Aumuller, Walter; Hitzel, Volker; and Schmidt, Felix Helmut, to Hoechst Aktiengesellschaft. Benzenesulfonyl ureas. 3,919,245, Cl. 260-294.80F.

Wheelabrator-Frye Inc.: *See*—
Van Fossen, Harvey, 3,918,212.

Whelan, Robert D.: *See*—
Gibson, Richard D.; and Whelan, Robert D., 3,918,392.

Whirlpool Corporation: *See*—
Platt, Clark I.; and Czech, James I., 3,918,644.

Whisler, Edwin Lee, to Deere & Company. Environmental control unit drain means. 3,918,271, Cl. 62-285.000.

Whitaker, Orion C., to Allis-Chalmers Corporation. Elongated rotary drum shell construction. 3,918,893, Cl. 432-103.000.

White, Fred K.: *See*—
Beall, Glenn Lee; and White, Fred K., 3,918,435.

White, Harold R.: *See*—
Doncer, Alexander J.; and White, Harold R., 3,919,088.

White, Howard Ray, Jr.: *See*—
Riley, Jesse Louis; and White, Howard Ray, Jr., 3,918,247.

White, Michael L., to Rohm and Haas Company. Retroreflective film. 3,919,031, Cl. 156-219.000.

White, Peter Charles: *See*—
Benson, John Terry; and White, Peter Charles, 3,918,195.

White, Ralph L., Jr.: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,919,231.

White, Ronald E.: *See—*
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,919,231.
Whitehead, Willard. U-Bolt bending machine. 3,918,286, Cl. 72-213.000.
Whitehurst, Darrell Duayne. Sorbent for removal of heavy metals. 3,919,077, Cl. 208-251.000.
Whitman, Robert L., to Zenith Radio Corporation. Slit detector for optical detector system. 3,919,562, Cl. 250-570.000.
Whitten, George R., Jr.; and Lewis, Jean E. Grill for swimming pool gutter. 3,918,107, Cl. 4-172.170.
Whittle, Benjamin. Method of repairing tire casings. 3,919,021, Cl. 156-97.000.
Wiechert, Rudolf: *See—*
Laurent, Henry; Wiechert, Rudolf; Hofmeister, Helmut; Mengel, Klaus; Wendt, Hans; and Annen, Klaus, 3,919,421.
Wieczorek, Theophil J.: *See—*
Brindisi, Frank A., Jr.; Wynschenk, Jo; and Wieczorek, Theophil J., 3,919,100.
Wilcox, Elizabeth, executrix: *See—*
Wilcox, William H., deceased, 3,918,334.
Wilcox, Harold D.; Griswold, Douglas A.; and Patel, Himanshu M., to Westinghouse Electric Corporation. Method of preventing degradation of yttrium oxide phosphor. 3,919,108, Cl. 252-301.30R.
Wilcox, William H., deceased (by Wilcox, Elizabeth, executrix), to Sun Studs, Inc. Method for guidance of saw blades utilizing bernoulli effect. 3,918,334, Cl. 83-13.000.
Wilder, Harry D., to Ethyl Corporation. Multi-stage chlorine dioxide delignification of wood pulp. 3,919,041, Cl. 162-25.000.
Wilkinson Sword Limited: *See—*
Atkins, Colin A., 3,918,155.
Will, Fritz G.; and Dubin, Robert R., to General Electric Company. Battery casing and sealed primary sodium-halogen battery. 3,918,992, Cl. 136-83.00R.
Williams, Allan L.; and Heck, Lyle D., to Check Mate Systems, Inc. System and method for detecting unauthorized removal of goods from protected premises, and magnet detecting apparatus suitable for use therein. 3,919,704, Cl. 340-280.000.
Williams, Donald L.: *See—*
Shuttleworth, Richmond G.; and Williams, Donald L., 3,918,832.
Williams, John R. Door lock. 3,918,121, Cl. 16-128.000.
Williams, Robert C.: *See—*
Douglas, Bobby L.; and Williams, Robert C., 3,918,843.
Williamson, Bobby Wayne: *See—*
Warnock, Emmit F.; Williamson, Bobby Wayne; Ellington, Gordon H.; and Mitchell, William O., 3,918,335.
Williamson, Donald J., to United States Steel Corporation. Bicycle stand-lock apparatus. 3,918,279, Cl. 70-234.000.
Williamson, John J. Night-time fishing alarm. 3,918,191, Cl. 43-17.000.
Willis, Candler A., Jr., to General Electric Company. Lamp ballast device. 3,919,595, Cl. 315-257.000.
Willis, Frank M.: *See—*
Brown, Theodore E., Jr.; and Willis, Frank M., 3,918,235.
Willis, Wilburn C., to Aluminum Company of America. Safety vent for a pressure container. 3,918,610, Cl. 222-397.000.
Willis, Wilburn C.: *See—*
Clawson, Robert G.; and Willis, Wilburn C., 3,918,378.
Wilson, Alexander. Threaded structure. 3,918,823, Cl. 403-343.000.
Wilson, David Henry: *See—*
Crossley, Jack; and Wilson, David Henry, 3,918,873.
Wilson, Harold R.: *See—*
Kurz, Arthur W., Jr.; and Wilson, Harold R., 3,918,799.
Wilson, Jack K.; and Wilson, Robert S. Adjustable type arrow rest for a bow. 3,918,428, Cl. 124-41.00A.
Wilson, James D., to Banner Metals Division Intercole Automation, Inc. Adjustable ramp. 3,918,368, Cl. 104-134.000.
Wilson, Robert S.: *See—*
Wilson, Jack K.; and Wilson, Robert S., 3,918,428.
Winey, James M., to Magnepan, Incorporated. Planar speaker. 3,919,499, Cl. 179-115.5PV.
Winkler, Alfred; Hennig, Fridolin; and Albrecht, Dieter, to Agfa-Gevaert Aktiengesellschaft. Multiple flash lamp holder for use with photographic apparatus. 3,919,539, Cl. 240-1.300.
Winkler, Max K., to Lear Motors Corporation. Vapor generator feedwater pump. 3,918,846, Cl. 417-269.000.
Winterbottom, Martin Richard: *See—*
Fox, John Cuthbert; Winterbottom, Martin Richard; and Culpin, Michael Frank, 3,918,399.
Winters, Robert E.; and McDonald, Charles H. Pavement composition. 3,919,148, Cl. 260-28.5AS.
Winzentsen, Uwe: *See—*
Limberger, Walter, deceased; Limberger, Jurgen, heir; Limberger, Ursula, heir; van Wely, Francois Prick; and Winzentsen, Uwe, 3,918,805.
Wirth, Gary J.; and Gelder, Kenneth M., to Speaker Motion Systems, Inc. Lateral discharge chute and gate apparatus. 3,918,572, Cl. 198-66.000.
Wirth, Siegfried: *See—*
Hintermeier, Karl; Trosken, Otto; and Wirth, Siegfried, 3,919,319.
Wisconsin Alumni Research Foundation: *See—*
Young, Warren C.; Boom, Roger W.; and Peterson, Harold A., 3,919,677.
Wise, Cecil S., to Fiber Controls Corporation. Weighing system. 3,918,539, Cl. 177-210.000.
Witte, Delbert W.: *See—*
Glick, William C., Jr.; and Witte, Delbert W., 3,918,320.
Witterick, Petrus Johannes Julius: *See—*
Bok, Johannes Gerardus; and Witterick, Petrus Johannes Julius, 3,918,884.
Wojciechowski, Jan: *See—*
Pakula, Ryszard; Wojciechowski, Jan; Poslinska, Halina; Pichnej, Lidia; Ptaszynski, Leszek; Przepalkowski, Adam; and Logwinieko, Roman, 3,919,247.
Wojcik, Charles W.: *See—*
Goold, Reed; Wojcik, Charles W.; and Cooper, Gerald D., 3,919,070.
Wokock, Ortwin; and Kaiser, Bernhard, to Kienzle Apparate GmbH. Apparatus for timing intervals of varying length. 3,918,562, Cl. 194-78.000.
Wokock, Ortwin: *See—*
Kaiser, Bernhard; and Wokock, Ortwin, 3,918,566.
Wolff & Kaaber: *See—*
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,919,127.
Wollensak, John C., to Ethyl Corporation. Phenol process. 3,919,332, Cl. 260-624.00R.
Wollensak, John C., to Ethyl Corporation. Alkylation process. 3,919,333, Cl. 260-624.00R.
Wollweber, Hartmund; and Flucke, Winfried, to Bayer Aktiengesellschaft. New aminophenylamidines, their production and their medicinal use. 3,919,315, Cl. 260-564.0RF.
Wolowodiuk, Walter, to Foster Wheeler Energy Corporation. Supercharged boiler. 3,918,411, Cl. 122-477.000.
Wolski, Adam M.; and Yates, Charles B., to Yates Industries, Inc. Plural copper-layer treatment of copper foil and article made thereby. 3,918,926, Cl. 29-195.000.
Wolstencroft, Michael John, to Du Pont of Canada Ltd. Feeder for tape weaving machine. 3,918,501, Cl. 139-122.00H.
Wood, Charles D., III: *See—*
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,937.
Holloway, John G.; Barch, Herbert W.; Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,943.
Treuhaft, Martin B.; and Wood, Charles D., III, 3,918,944.
Wood, Dennis E., to Rando Machine Corporation. Method and machine for forming random fiber webs. 3,918,126, Cl. 19-156.300.
Woodruff, Gene N.: *See—*
Pitchford, Armin C.; and Woodruff, Gene N., 3,919,072.
Woodward Governor Company: *See—*
Wernberg, Donald E., 3,918,254.
Woodward, Robert Burns, to Ciba-Geigy Corporation. Dioxatricyclodecanol, esters thereof, and process for their manufacture. 3,919,249, Cl. 260-340.700.
Worbois, Robert J., to Westinghouse Air Brake Company. Manually operable apparatus for cut-off of brake pipe pressure maintaining. 3,918,769, Cl. 303-66.000.
Wren, Jack: *See—*
Breakey, James W.; Freter, John M.; and Wren, Jack, 3,918,103.
Wright, Charles Donald; Gutfreund, Kurt; and Brzuskiewicz, John, to IIT Research Institute. Surface lubrication of magnetic media. 3,919,719, Cl. 360-134.000.
Wright, George C.: *See—*
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,919,231.
Wright, Jack C.: *See—*
Vennard, William O.; and Wright, Jack C., 3,918,443.
Wright, Lawrence G.: *See—*
Abruzzo, Joseph; Lori, Frederick J.; Synowka, Theodore W.; Wright, Lawrence G.; and Foertsch, William H., 3,918,304.
Wulf, Elmer B. Safety binding for skis. 3,918,732, Cl. 280-11.35K.
Wunderlich, Hermann: *See—*
Klag, Gunther; Wunderlich, Hermann; Jung, Gerhard; and Aumuller, Rolf, 3,919,334.
Wunsch, Gerd: *See—*
Ebenhoech, Franz Ludwig; Werner, Dietmar; Bock, Gustav; Wunsch, Gerd; Opp, Karl; and Ostertag, Werner, 3,918,985.
Wuonola, Mark A.: *See—*
Sam, Donnie Joe; and Wuonola, Mark A., 3,919,423.
Wynn, Gordon Williams. Workpiece location means. 3,918,340, Cl. 83-765.000.
Wynschenk, Jo: *See—*
Brindisi, Frank A., Jr.; Wynschenk, Jo; and Wieczorek, Theophil J., 3,919,100.
Xerox Corporation: *See—*
Bar-on, Ari, 3,918,804.
Cheeseman, Robert A., 3,918,400.
Cook, John H., 3,918,806.
Goffe, William L., 3,918,969.
Hwa, Stephen C. P., 3,918,807.
Hwa, Stephen C. P., 3,918,809.
Koch, Gilbert E.; and Hubler, Lawrence C., 3,918,705.
Krohn, Ivar T.; Page, Geoffrey A.; and Tulagin, Vesvolod, 3,918,967.
Lindblad, Nero R.; and Werner, Walter F., 3,918,337.
Thettu, Raghulinga R., 3,918,397.
Torpie, John D., 3,919,476.
Vock, Richard C., 3,918,403.

Yamada, Hiroshi: *See*—
Mano, Hiroshi; and Yamada, Hiroshi, 3,918,703.
Yamada, Junzo: *See*—
Kitaoka, Takashi; Shirane, Yasuhiro; and Yamada, Junzo, 3,918,369.
Yamada, Katsutoshi: *See*—
Sekine, Hiroshi; Maruyama, Tadakatsu; and Yamada, Katsutoshi, 3,918,999.
Yamaguchi, Tadashi; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, to Lion Fat & Oil Co., Ltd. Method of manufacturing polymer graft-polymerized onto water soluble inorganic substance. 3,919,178, Cl. 260-79.30R.
Yamaguchi, Yasumasa: *See*—
Ashina, Yoshiro; Yamaguchi, Yasumasa; and Fujiwara, Atushi, 3,918,917.
Yamamoto, Minoru; and Matsumi, Sho, to Nippon Kokan Kabushiki Kaisha. Method for the disposal of garbage by multi-stage thermal decomposition. 3,918,374, Cl. 110-8.00E.
Yamamura, Tadashi: *See*—
Matsumura, Sakujiro; Yamamura, Tadashi; Ogura, Akira; and Hayashi, Masataka, 3,918,245.
Yamaoka, Yoshiaki: *See*—
Katoh, Takashi; and Yamaoka, Yoshiaki, 3,918,128.
Yamarik, George J.; and Craig, Harold M., to United Technologies Corporation. Centrifugal cooling air filter. 3,918,835, Cl. 416-95.000.
Yankowsky, Anthony Walter, to Fiber Industries, Inc. Hydrolytic and melt degradation stabilized polyester. 3,919,383, Cl. 264-176.00F.
Yao, Takamu: *See*—
Takahashi, Akikazu; Futatsugi, Yuji; Yao, Takamu; and Higashide, Yoichi, 3,919,440.
Yarrington, Robert Warren, to Pennwalt Corporation. Preanneal rinse process for inhibiting rust on steel strip. 3,919,000, Cl. 148-14.000.
Yashica Co., Ltd.: *See*—
Okamoto, Hajime, 3,918,750.
Yasuda, Kenji: *See*—
Shimizu, Takuji; Ohara, Isao; and Yasuda, Kenji, 3,919,450.
Yata, Kotaro; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Bracket type electronic flash device. 3,919,538, Cl. 240-1.300.
Yates, Charles B.: *See*—
Wolski, Adam M.; and Yates, Charles B., 3,918,926.
Yates Industries, Inc.: *See*—
Wolski, Adam M.; and Yates, Charles B., 3,918,926.
Yeda Research and Development Company, Ltd.: *See*—
Patchornik, Abraham; and Haviv, Fortuna, 3,919,206.
Patchornik, Abraham; and Haviv, Fortuna, 3,919,208.
Yokoyama, Taizo: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,918,974.
Yoneda, Masahiko: *See*—
Sasajima, Ken-ichi; and Yoneda, Masahiko, 3,919,046.
York, Herbert; Young, Bryan; and Wallace, Alec. Pile fabric circular knitting machines. 3,918,274, Cl. 66-9.00B.
Yoshihara, Ichiro: *See*—
Iwasawa, Maozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,352.
Iwasawa, Naozumi; Shibata, Minoru; Watanabe, Tadashi; and Yoshihara, Ichiro, 3,919,350.
Yoshikawa, Kunihiko, to Kabushiki Kaisha Yoshikawa Seisakusho. Safety cap for the inner wire of a Bowden cable. 3,918,120, Cl. 16-108.000.
Yoshimura, Shigetake: *See*—
Hirose, Yutaka; and Yoshimura, Shigetake, 3,918,257.
Yoshino, Tomii: *See*—
Nishiwaki, Fukujiro; and Yoshino, Tomii, 3,918,376.
Yoshizaki, Shiro: *See*—
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Murakami, Nanami; Mori, Hideo; and Tominaga, Michiaki, 3,919,239.
You, Chia-Nien: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,919,231.
Young, Bryan: *See*—
York, Herbert; Young, Bryan; and Wallace, Alec, 3,918,274.
Young Engineering & Manufacturing Company, Inc.: *See*—
Young, Henry A., 3,918,105.
Young, Henry A., to Young Engineering & Manufacturing Company, Inc. Hydraulically operated liquid valve with two closable inlets. 3,918,105, Cl. 4-67.00A.
Young, Richard A.; and Radak, William J., to De Soto, Inc. Removal of unreacted acid from polythylenic polyesters. 3,919,349, Cl. 260-837.00R.
Young, Warren C.; Boom, Roger W.; and Peterson, Harold A., to Wisconsin Alumni Research Foundation. Support structure for a superconducting magnet. 3,919,677, Cl. 335-216.000.
Youngstown Sheet and Tube Company: *See*—
Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., 3,918,284.
Yu, Arthur J.: *See*—
Dyer, James N.; and Yu, Arthur J., 3,919,137.
Yu, Se Puan; and Tantraporn, Wirojana, to General Electric Company. Avalanche diode oscillator. 3,919,667, Cl. 331-96.000.
Yumde, Yasufumi; Narita, Sho; Murai, Mikio; and Kubota, Takashi, to Hitachi, Ltd. Magnetic recording and/or reproducing apparatus for bandwidth reduced video signal and delayed audio signal. 3,919,716, Cl. 360-9.000.
Yuzawa, Ryozo: *See*—
Mimata, Tsutomu; and Yuzawa, Ryozo, 3,918,144.
Zach, George O., Jr., to Allis-Chalmers Corporation. Gear shift spline lock. 3,918,560, Cl. 192-114.00T.
Zacharski, Edward J.: *See*—
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 3,919,462.
Zahid, Abduz, to Greer Hydraulics, Inc. Shock absorber. 3,918,693, Cl. 267-64.00R.
Zahnradfabrik Friedrichshafen: *See*—
Jablonsky, Erich; Pfundstein, Wolfgang; and Elser, Dieter, 3,918,544.
Zajacek, John G.: *See*—
Rosenthal, Rudolph; and Zajacek, John G., 3,919,278.
Rosenthal, Rudolph; and Zajacek, John G., 3,919,279.
Rosenthal, Rudolph; Zajacek, John G.; and O'Toole, James T., 3,919,280.
Zak, Edward J.: *See*—
Best, Howard S.; Milliman, Bruce A.; and Zak, Edward J., 3,918,216.
Zak, Thomas J. Tennis training ball target and projector. 3,918,711, Cl. 273-29.00A.
Zakhidov, Romen Abdullaevich; and Teplyakov, Dmitry Ivanovich. Calorimeter. 3,918,303, Cl. 73-190.00R.
Zamax Manufacturing Co., Inc.: *See*—
Denzer, Alan R.; and Powers, Edward F., Jr., 3,918,735.
Zamboni, Leopoldo; Minervini, Mauro; and Zifferero, Marcello, to Nalco Chemical Company. Controlling concentration of additive in an evaporative system. 3,918,469, Cl. 137-5.000.
Zarnoti, Sandor J. Rotary engine. 3,918,860, Cl. 418-191.000.
Zenbutsu, Tadashi: *See*—
Takebe, Toshio; Zenbutsu, Tadashi; Omata, Kinji; Mogi, Hiroya; and Taniguchi, Yoshitaka, 3,919,436.
Zenith Radio Corporation: *See*—
Adler, Robert; and Laub, Leonard J., 3,919,465.
Schott, Wayne M., 3,919,478.
Whitman, Robert L., 3,919,562.
Ziegler, William H., to United States of America, Army. Frictional lock for retaining a rotatable piston against axial displacement. 3,918,346, Cl. 89-37.00C.
Zifferero, Marcello: *See*—
Zamboni, Leopoldo; Minervini, Mauro; and Zifferero, Marcello, 3,918,469.
Zimmer Aktiengesellschaft: *See*—
Rothe, Hans-Jochen; Oxley, John H.; and Terrier, Francois, 3,919,288.
Zimmer, George A.; Allaben, Charles M.; and Weidman, William K., to Borg-Warner Corporation. Roller bearing assembly. 3,918,776, Cl. 308-194.000.
Zimmer, Hildebrand, to Dragerwerk AG. Cryoprobe construction. 3,918,439, Cl. 128-7.000.
Zimmerman, Richard F., to International Harvester Company. Linkage restraining safety device. 3,918,601, Cl. 214-776.000.
Zinnes, Harold: *See*—
Sircar, Jagadish C.; and Zinnes, Harold, 3,919,203.
Zmojdzin, Andrzej; and Hoffman, Boguslaw, to Chemiczna Spoldzielnia pracy "Synteza". Method of production of quinoxaline, obtained particularly from not purified raw materials. 3,919,223, Cl. 260-250.00Q.
Zodrow, Rudolf, to Jagenberg Werke AG. Apparatus for applying gummed labels to continuously advancing bottles or other objects. 3,919,040, Cl. 156-571.000.
Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 3,919,329.
Zoiss, Melvin Howard, to Barnes Drill Co. Filamentary cutting tool containing solid microparticles and method of making it. 3,918,218, Cl. 51-298.000.
Zolotarevskaya, Nina Nikolaevna: *See*—
Bakhitov, Mansur Idiatullovich; Kuznetsov, Evgeny Vasilievich; Zolotarevskaya, Nina Nikolaevna; Popova, Nataliya Alexandrovna; Golov, Veniamin Grigorievich; Rodionov, Jury Alexandrovich; Molev, Igor Ivanovich; and Kotlyarsky, Vladimir Mortkovich, 3,919,195.
Zumbach Electronic-Automatic: *See*—
Nopper, Peter, 3,919,560.
Zviak, Charles; and Daeninckx, Jean, to Societe Anonyme dite: L'Oreal. Insecticidal composition containing dimethyl dichlorovinyl phosphate and a polymer of polyethylene fatty acid. 3,919,419, Cl. 424-219.000.
Zweig, Gilbert, to Pitney-Bowes, Inc. Method for creating multiple electrostatic copies by persistent conductivity. 3,918,971, Cl. 96-1.400.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 289,471	3,917,184	Nov. 4, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 292,054	3,915,877	Oct. 28, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 292,126	3,914,465	Oct. 21, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 292,140	3,914,340	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 293,437	3,913,414	Oct. 21, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 294,579	3,916,737	Nov. 4, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 294,673	3,916,023	Oct. 28, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 295,674	3,916,107	Oct. 28, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 299,267	3,917,106	Nov. 4, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 303,702	3,914,131	Oct. 21, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 305,417	3,915,882	Oct. 28, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 306,938	3,916,050	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 307,677	3,915,276	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 308,892	3,919,624	Nov. 11, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 309,207	3,914,743	Oct. 21, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 309,755	3,919,468	Nov. 11, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 309,756	3,914,136	Oct. 21, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 311,317	3,918,975	Nov. 11, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 313,900	3,915,932	Oct. 28, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 315,731	3,914,108	Oct. 21, 1975	B 364,241	3,916,668	Nov. 4, 1975
B 316,239	3,913,546	Oct. 21, 1975	B 364,528	3,919,510	Nov. 11, 1975
B 318,195	3,915,699	Oct. 28, 1975	B 365,490	3,918,527	Nov. 11, 1975
B 318,618	3,915,365	Oct. 28, 1975	B 365,834	3,914,702	Oct. 21, 1975
B 318,745	3,916,571	Nov. 4, 1975	B 365,855	3,917,258	Nov. 4, 1975
B 319,339	3,916,056	Oct. 28, 1975	B 366,589	3,914,719	Oct. 21, 1975
B 319,402	3,919,568	Nov. 11, 1975	B 367,021	3,914,752	Oct. 21, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 367,661	3,914,158	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 368,392	3,913,812	Oct. 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 368,397	3,914,677	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 369,997	3,913,533	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 371,805	3,914,433	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 373,428	3,915,511	Oct. 28, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 376,504	3,914,570	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 376,799	3,913,955	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 377,172	3,918,255	Nov. 11, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 377,833	3,913,884	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 377,869	3,917,002	Nov. 4, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 379,172	3,914,379	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 379,282	3,913,462	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 379,955	3,913,157	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 380,312	3,913,953	Oct. 21, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 380,900	3,913,307	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 381,074	3,919,583	Nov. 11, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 381,632	3,914,732	Oct. 21, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 382,021	3,913,212	Oct. 21, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 382,261	3,914,991	Oct. 28, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 382,783	3,919,527	Nov. 11, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 383,532	3,914,246	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 384,658	3,913,452	Oct. 21, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 384,773	3,915,416	Oct. 28, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 387,687	3,918,151	Nov. 11, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 387,761	3,914,245	Oct. 21, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 387,818	3,918,935	Nov. 11, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 389,070	3,914,171	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 389,285	3,914,631	Oct. 21, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 389,639	3,914,626	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 389,932	3,913,268	Oct. 21, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 389,933	3,913,267	Oct. 21, 1975	B 411,633	3,914,741	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975	B 413,006	3,914,850	Oct. 28, 1975
B 390,732	3,913,878	Oct. 21, 1975	B 415,113	3,915,717	Oct. 28, 1975
B 391,184	3,914,214	Oct. 21, 1975	B 415,124	3,915,944	Oct. 28, 1975
B 391,210	3,914,220	Oct. 21, 1975	B 415,847	3,914,208	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975	B 417,299	3,918,235	Nov. 11, 1975
B 391,675	3,916,017	Oct. 28, 1975	B 418,302	3,913,252	Oct. 21, 1975
B 392,696	3,916,175	Oct. 28, 1975	B 420,016	3,914,572	Oct. 21, 1975
B 392,732	3,914,903	Oct. 21, 1975	B 421,026	3,914,785	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975	B 421,797	3,914,023	Oct. 21, 1975
B 392,894	3,914,763	Oct. 21, 1975	B 424,415	3,919,458	Nov. 11, 1975
B 393,163	3,914,535	Oct. 21, 1975	B 425,035	3,914,025	Oct. 21, 1975
B 393,970	3,914,638	Oct. 21, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 394,088	3,914,740	Oct. 21, 1975	B 425,541	3,914,051	Oct. 21, 1975
B 394,300	3,914,159	Oct. 21, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 395,496	3,919,435	Nov. 11, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 395,889	3,913,190	Oct. 21, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 396,025	3,913,869	Oct. 21, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 397,527	3,913,488	Oct. 21, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 397,990	3,914,848	Oct. 28, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 398,262	3,913,481	Oct. 21, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 398,597	3,913,743	Oct. 21, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 399,292	3,914,810	Oct. 28, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 399,304	3,919,567	Nov. 11, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 399,766	3,915,667	Oct. 28, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 400,310	3,915,507	Oct. 28, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 402,555	3,914,688	Oct. 21, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 403,140	3,913,486	Oct. 21, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 403,990	3,914,684	Oct. 21, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28,.1975	B 455,775	3,914,356	Oct. 21, 1975
B 404,437	3,915,200	Oct. 28, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 405,136	3,915,565	Oct. 28, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 405,137	3,915,566	Oct. 28, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 405,360	3,913,403	Oct. 21, 1975			

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alps Electric Co., Ltd.: *See*—
Shirakawa, Takashi, Re. 28,611.

Babette Dixon as Trustee of a trust identified as Paul H. Dixon Trust dated Jan. 28, 1975: *See*—
Dixon, Paul H., Re. 28,608.

Communications Satellite Corporation: *See*—
Lindmayer, Joseph, Re. 28,610.

Dixon, Paul H., to Babette Dixon as Trustee of a trust identified as Paul H. Dixon Trust dated Jan. 28, 1975. Automatic assembly machine. Re. 28,608, Cl. 29-211.00R.

Frieband, Neil G.; and Kendrick, Douglas O., to Incoterm Corporation. Digital processor having automatic conflict-resolving logic. Re. 28,612, Cl. 340-172.500.

Incoterm Corporation: *See*—
Frieband, Neil G.; and Kendrick, Douglas O., Re. 28,612.

Kendrick, Douglas O.: *See*—
Frieband, Neil G.; and Kendrick, Douglas O., Re. 28,612.

Lindmayer, Joseph, to Communications Satellite Corporation. Fine Geometry Solar Cell. Re. 28,610, Cl. 136-89.000.

Malburet, Rene A., to Saint-Gobain Industries. Apparatus for handling fragile sheets. Re. 28,609, Cl. 214-1.00Q.

Saint-Gobain Industries: *See*—
Malburet, Rene A., Re. 28,609.

Shirakawa, Takashi, to Alps Electric Co., Ltd. Variable condenser. Re. 28,611, Cl. 317-254.000.

LIST OF PLANT PATENTEES

Bakker, J. C., & Sons, Ltd.: *See*—
Bakker, John C., Jr. 3,801.

Bakker, John C., Jr., to J. C. Bakker & Sons, Ltd. Juniper bakaurea. 3,801, 11–11–75, Cl. 50.

Conard-Pyle Co., The: *See*—
Meilland, Marie-Louise, and A. A., and Richardier. 3,803.
Meilland, Marie-Louise, and A. A., and Richardier. 3,804.

Meilland, Alain A.: *See*—
Meilland, Marie-Louise, and A. A., and Richardier. 3,803.
Meilland, Marie-Louise, and A. A., and Richardier. 3,804.

Meilland, Marie-Louise, and A. A., and M. M. Richardier, to The Conard-Pyle Co. Rose plant—meigerium variety. 3,803, 11–11–75, Cl. 20.

Meilland, Marie-Louise, and A. A., and M. M. Richardier, to The Conard-Pyle Co. Rose plant—meiringa variety. 3,804, 11–11–75, Cl. 14.

Meyer, Carl. Rose plant—bicentennial variety. 3,802, 11–11–75, Cl. 22.

Richardier, Michele M.: *See*—
Meilland, Marie-Louise, and A. A., and Richardier. 3,803.
Meilland, Marie-Louise, and A. A., and Richardier. 3,804.

LIST OF DESIGN PATENTEES

Acra-Plant, Inc.: *See*—
Williams, Donald E., and Robertson. 237,644.

Agatani, Katsuzo. Exercising table. 237,654, 11–11–75, Cl. D83—25.

Aktiebolaget Svenska Flaktfabriken: *See*—
Larkfeldt, Birger, and Widerby. 237,618.

American Standard, Inc.: *See*—
Saporito, Dominic A., and Genaro. 237,613–5.

Bard, William. Shield for pinsetting mechanism on bowling lane. 237,637, 11–11–75, Cl. D34—5.

Baynes, William H. Game puzzle. 237,640, 11–11–75, Cl. D34—15.

Baynes, William H. Stacked jack game puzzle. 237,642, 11–11–75, Cl. D34—15.

Bell & Howell Co.: *See*—
Dean, George R., Ricks, and Dalenberg. 237,608.

Berger, Irvin E., and K. F. Welter, to Sears, Roebuck & Co. Mounting bracket for bicycle. 237,600, 11–11–75, Cl. D12—114.

Braun Aktiengesellschaft: *See*—
Ullmann, Roland. 237,650.

Brosk, Doris. Apron. 237,557, 11–11–75, Cl. D2—228.

Buell, Bruce A.: *See*—
Wolf, Arnold, Buell, and Howe. 237,625.

Calame, Blaise. Acoustical headband. 237,558, 11–11–75, Cl. D2—259.

Calvert, Rodney K. Bottle carrier. 237,589, 11–11–75, Cl. D9—178.

Cantley, Ross H., to The Royal Bank of Canada. Safety deposit box system. 237,630, 11–11–75, Cl. D31—22.

Capesius, Michael E.: *See*—
Pidduck, Kurt P., and Capesius. 237,645–6.

Central Glass Co., Ltd.: *See*—
Koyama, Kenichi. 237,572.

Century Wheels Research Corp.: *See*—
Morgan, Paul A. 237,623.

Chase-Shawmut Co., The: *See*—
Kozacka, Frederick J., and Salzer. 237,621.

Christian, Hubert E., to Dart Industries Inc. Pour spout lid. 237,592, 11–11–75, Cl. D9—254.

Christian, Hubert E., to Dart Industries Inc. Plant receptacle. 237,643, 11–11–75, Cl. D35—3.

Chvala, William J.: *See*—
Clarke, Richard A., Chvala, and DeWitte. 237,597.

Cible, Pierre, to Cible Projecteurs. Vehicle headlight. 237,648, 11–11–75, Cl. D48—32.

Cible Projecteurs: *See*—
Cible, Pierre. 237,648.

Clarke, Richard A., W. J. Chvala, and R. E. DeWitte, to PepsiCo, Inc. Portable display cart. 237,597, 11–11–75, Cl. D12—25.

Clemens, Robert W., to Wesco Industries Corp. Needle protector for detecting defective operation in a knitting machine. 237,656, 11–11–75, Cl. D92—15.

Coil-Ler Mfg. Co.: *See*—
Rogers, Lincoln. 237,827.

Coleco Industries, Inc.: *See*—
Gerber, Gary A., and Zimmers. 237,563.

Cordner, Frederic H. Hectographic carbon duplicator. 237,653, 11–11–75, Cl. D64—11.

Cox, Richard D. Portable round bale feeder. 237,599, 11–11–75, Cl. D12—105.

Cyren, Gunnar, to Dansk International Designs Ltd. Salt/pepper mill. 237,576, 11–11–75, Cl. D7—53.

Cyren, Gunnar, to Dansk International Designs Ltd. Fork or similar article. 237,579, 11–11–75, Cl. D7—137.

Dalenberg, David D.: *See*—
Dean, George R., Ricks, and Dalenberg. 237,608.

Dansk International Designs Ltd.: *See*—
Cyren, Gunnar. 237,576.
Cyren, Gunnar. 237,579.

Dart Industries Inc.: *See*—
Christian, Hubert E. 237,592.
Christian, Hubert E. 237,643.
Lavlon, Harry. 237,564.

Dean, George R., J. B. Ricks, and D. D. Dalenberg, to Bell & Howell Co. Electronic instructional console. 237,608, 11–11–75, Cl. D19—60.

DeFluri, Niel: *See*—
Katzman, Marvin, and DeFluri. 237,631.

DeRue, Monica P., Pillow. 237,569, 11–11–75, Cl. D6—203.

De Vore, R. A.: *See*—
Thomas, Robert W. 237,578.

De Vore, William D.: *See*—
Thomas, Robert W. 237,578.

DeWitte, Raymond E.: *See*—
Clarke, Richard A., Chvala, and DeWitte. 237,597.

Doherty, John J. Time teaching aide. 237,609, 11–11–75, Cl. D19—64.

Doty, Ralph E., Jr. Chair. 237,566, 11–11–75, Cl. D6—47.

Drackett Co., The: *See*—
Jones, David A., and McIlvain. 237,620.

Dunlop Ltd.: *See*—
Sanders, Roger D. 237,602.

Eastman Kodak Co.: *See*—
McClure, Andrew Y. 237,651–2.

Engelsher, Harvey J., to Horizon Industries, Ltd. Aspirator-irrigator. 237,655, 11–11–75, Cl. D83—12.

Fairchild Camera and Instrument Corp.: *See*—
Oyama, Terrell. 237,622.

Foote, J. B., Foundry Co., The: *See*—
Hauser, Hans. 237,649.

Gardisette International AG: *See*—
Schroeder, Herr P. E. 237,647.

Genaro, Donald M.: *See*—
Saporito, Dominic A., and Genaro. 237,613–5.

Gerber, Gary A., and M. Zimmers, to Coleco Industries, Inc. Convertible game table assembly. 237,563, 11–11–75, Cl. D6—27.

Goertzen, Frank. Tumbler. 237,574, 11–11–75, Cl. D7—6.
Goertzen, Frank. Condiment shaker. 237,577, 11–11–75, Cl. D7—54.
Goertzen, Frank. Bottle. 237,584, 11–11–75, Cl. D9—54.
Goertzen, Frank. Pitcher. 237,585, 11–11–75. Cl. D7—64.
Goodyear Tire & Rubber Co., The: *See*—
Stiffler, James W., and Wilson. 237,603.
Goransson, Bengt Sigvard: *See*—
Hagglund, Bengt G., and Goransson. 237,820.
Gordon, Leonard. Whirlpool bathtub. 237,616, 11–11–75, Cl. D23—55.
Gutkowski, Ronald R., to S. C. Johnson & Son, Inc. Packaging container for chemically impregnated wipes or the like. 237,591, 11–11–75, Cl. D9—222.
Hagglund, Gengt G., and B. S. Goransson, to Bengt G. Hagglund. Dispensing container for paper towels or the like. 237,820, 11–25–75, Cl. D52—2.
Hagglund, Bengt G.: *See*—
Goransson, Bengt S., and Hagglund. 237,820.
Hamada, Kenji. Video cassette recorder or similar article. 237,626, 11–11–75, Cl. D26—14.
Hamilton, Marshall. Condiment bowl. 237,575, 11–11–75, Cl. D7—20.
Haug, Thomas J. Adjustable leg. 237,573, 11–11–75, Cl. D6—194.
Hauser, Hans, to The J. B. Foote Foundry Co. Transmission. 237,649, 11–11–75, Cl. D55—1.
Horizon Industries, Ltd.: *See*—
Engelsher, Harvey J. 237,655.
Howe, William E.: *See*—
Wolf, Arnold, Buell, and Howe. 237,625.
International Business Machines Corp.: *See*—
Rinkleib, Helfried O., and Switser. 237,624.
Instrumentation Specialties Co.: *See*—
Lederer, Louis P. 237,632.
Jack, Joseph D. Transistor integrated circuit testers and design aid. 237,596, 11–11–75, Cl. D10—75.
Jacobs, Jerry E., to Winnebago Industries, Inc. Truck box side panel. 237,598, 11–11–75. Cl. D12—98.
Johnson, S. C., & Son, Inc.: *See*—
Gutkowski, Ronald R. 237,591.
Johnston, Versie M. Pillow case. 237,559, 11–11–75, Cl. D2—264.
Johnston, Versie M. Pillow case. 237,560, 11–11–75, Cl. D2—264.
Jones, David A., and H. H. McIlvain, to The Brackett Co. Refrigerator deodorant container. 237,620, 11–11–75, Cl. D23—159.
Kato, Kosei, to Tomy Kogyo Co., Inc. Cycle for a toy doll. 237,641, 11–11–75, Cl. D34—15.
Katzman, Marvin, and N. DeFluri. Medical suction valve. 237,631, 11–11–75, Cl. D32—1.
Keene, George W. Combined animal oiler and scratcher. 237,629, 11–11–75, Cl. D30—99.
Kemp, Norman H. Plural compartment pressurized dispensing container. 237,583, 11–11–75, Cl. D9—18.
Kesner, Robert A. Belt mountable optical eyeglass case holder. 237,561, 11–11–75, Cl. D2—400.
Kessler, Joseph V., assignor of a fractional part interest to Robert J. Walton. Amusement game cabinet. 237,638, 11–11–75, Cl. D34—5.
Ketcham & McDougall, Inc.: *See*—
Macowski, William. 237,610.
King Radio Corp.: *See*—
Vetter, Lee J. 237,594.
Kira, Hiroshi. Maintenance vehicle ladder rack. 237,604, 11–11–75, Cl. D12—157.
Korn, Norman C. Cocktail table. 237,567, 11–11–75, Cl. D6—179.
Koyama, Kenichi, to Central Glass Co., Ltd. Leg for a table or like structure. 237,572, 11–11–75, Cl. D6—194.
Kozacka, Frederick J., and E. Salzer, to The Chase-Shawmut Co. Electrical fuse for elevated voltages. 237,621, 11–11–75, Cl. D26—1.
Lampinen, Wesley. Woodholder. 237,580, 11–11–75, Cl. D7—212.
Lane, Vernon E., Jr. Shelf unit or similar article. 237,571, 11–11–75, Cl. D6—186.
Larkfeldt, Birger, and L. Widerby, to Aktiebolaget Svenska Flaktfabriken. Adjustable air outlet. 237,618, 11–11–75, Cl. D23—141.
Lax, Michael. Tea kettle. 237,570, 11–11–75, Cl. D7—60.
Layton, Harry, to Dart Industries Inc. Pedestal table. 237,564, 11–11–75, Cl. D6—27.
Leclerc, Raymond W. Hockey stick. 237,636, 11–11–75, Cl. D34—5.
Lederer, Louis F., to Instrumentation Specialties Co. Sample collector or other similar article. 237,632, 11–11–75, Cl. D32—1.
Levey, John S. Dispensing container for a cake of fabric softener and anti-static agent for use in automatic clothes dryers. 237,619, 11–11–75, Cl. D23—150.
Lund, Allan W. Motor cycle side car. 237,601, 11–11–75, Cl. D12—116.
MTM Molded Products Co.: *See*—
Minneman, William J. 237,611.
Macowski, William, to Ketcham & McDougall, Inc. Pencil sharpener. 237,610, 11–11–75, Cl. D19—73.
Martin, Russell W., Jr. Game piece. 237,635, 11–11–75, Cl. D23—5.
Maxwell, James D. Fish lure. 237,612, 11–11–75, Cl. D22—27.
McClare, Andrew V., to Eastman Kodak Co. Planetary microfilmer or the like. 237,651, 11–11–75, Cl. D61—1.
McClare, Andrew V., to Eastman Kodak Co. Microfilmer or the like. 237,652, 11–11–75, Cl. D61—1.
McIlvain, Howard H.: *See*—
Jones, David A., and McIlvain. 237,620.
McIntosh, Lawrie G., to Reliance Products Ltd. Portable sink. 237,617, 11–11–75, Cl. D23—58.
Meisner, Edward. Measuring tape. 237,595, 11–11–75, Cl. D10—72.
Melnechenko, Terrance G. Blade guard for skates. 237,639, 11–11–75, Cl. D34—14.
Middlemark, Marvin P. Television antenna rod for indoor use. 237,627, 11–11–75, Cl. D26—14.
Minneman, William J., to MTM Molded Products Co. Belt attachable cartridge case. 237,611, 11–11–75, Cl. D22—14.
Morgan, Paul A., to Century Wheels Research Corp. Magazine for storing information on tapes. 237,623, 11–11–75, Cl. D26—14.
Mori, Nobuyuki, to Onitsuka Co., Ltd. Spike for a shoe. 237,562, 11–11–75, Cl. D2—314.
Mostyn, Peter F., to Spear & Jackson (Tools) Ltd. Hammer. 237,582, 11–11–75, Cl. D8—75.
National Game Corp.: *See*—
Scantlin, John R. 237,590.
Nelson, Marvin H. Potted plants. 237,568, 11–11–75, Cl. D6—182.
Onitsuka Co., Ltd.: *See*—
Mori, Nobuyuki. 237,562.
Owens-Illinois, Inc.: *See*—
Plummer, James E. 237,586.
Oyama, Terrell, to Fairchild Camera and Instrument Corp. Casing for an electronic calculator or the like. 237,622, 11–11–75, Cl. D26—5.
PepsiCo, Inc.: *See*—
Clarke, Richard A., Chvala, and DeWitte. 237,597.
Pesquale, Michael J. Bottle opener or similar article. 237,581, 11–11–75, Cl. D8—18.
Pidduck, Kurt P., and M. E. Capesius. Tree topper vehicle. 237,645, 11–11–75, Cl. D40—1.
Plummer, James E., to Owens-Illinois, Inc. Combined jar and stopper. 237,586, 11–11–75, Cl. D9—118.
Poloron Products, Inc.: *See*—
Sharp, Bernard C. 237,588.
Pretty Products, Inc.: *See*—
Wells, Charles A. 237,605.
Reliance Products Ltd.: *See*—
McIntosh, Lawrie G. 237,617.
Ricketts, Glenn M. Arm muscle exercising apparatus. 237,634, 11–11–75, Cl. D34—5.
Ricks, James R.: *See*—
Dean, George R., Ricks, and Dalenberg. 237,608.
Rinkleib, Helfried O., and G. L. Switser, to International Business Machines Corp. Magnetic tape cartridge. 237,624, 11–11–75, Cl. D26—14.
Robertson, Forrest E.: *See*—
Williams, Donald E., and Robertson. 237,644.
Rockwell International Corp.: *See*—
Warren, Robert G., Stearns, and Whitcomb. 237,565.
Rogers, Lincoln, to Coil-Ler Mfg. Co. Coil-winding machine. 237,827, 11–25–75, Cl. D54—14.
Royal Bank of Canada, The: *See*—
Cantley, Ross H. 237,630.
Russo, Michael T. Cap for use with a link chain support post. 237,628, 11–11–75, Cl. D28—1.
Rustler, Inc., The: *See*—
Van Den Hoed, Rutt. 237,606.
Salzer, Erwin: *See*—
Kozacka, Frederick J., and Salzer. 237,621.
Sanders, Roger D., to Dunlop Ltd. Tire for a vehicle wheel. 237,602, 11–11–75, Cl. D12—142.
Saporito, Dominic A., and D. M. Genaro, to American Standard, Inc., Lavatory fixture unit. 237,613, 11–11–75, Cl. D23—25.
Saporito, Dominic A., and D. M. Genaro, to American Standard, Inc., Lavatory fixture unit. 237,614, 11–11–75, Cl. D23—25.
Saporito, Dominic A., and D. M. Genaro, to American Standard, Inc. Faucet. 237,615, 11–11–75, Cl. D23—25.
Scantlin, John R., to National Game Corp. Game box. 237,590, 11–11–75, Cl. D9—185.
Schroeder, Herr P. E., to Gardisette International AG. Curtain pattern (No. 415). 237,647, 11–11–75, Cl. D47—6.
Sears, Roebuck & Co.: *See*—
Berger, Irvin E., and Welter. 237,600.
Sharp, Bernard C., to Poloron Products, Inc. Canteen. 237,588, 11–11–75, Cl. D9—168.
Spear & Jackson (Tools) Ltd.: *See*—
Mostyn, Peter F. 237,582.
Stearns, Frederick S.: *See*—
Warren, Robert G., Stearns, and Whitcomb. 237,565.
Stiffler, James W., and A. R. Wilson, to The Goodyear Tire & Rubber Co. Tire. 237,603, 11–11–75, Cl. D12—147.
Switser, Gary L.: *See*—
Rinkleib, Helfried O., and Switser. 237,624.
Thomas, Robert W., to William D. De Vore and R. A. De Vore. Cooker. 237,578, 11–11–75, Cl. D7—94.
Tibbs, Clarence V. Clock. 237,593, 11–11–75, Cl. D10—6.
Tomy Kogyo Co., Inc.: *See*—
Kato, Kosei. 237,641.
Torres, Ignacio L., Jr. Dwelling construction. 237,607, 11–11–75, Cl. D13—1.
Ulimann, Roland, to Braun Aktiengesellschaft. Flash unit. 237,650, 11–11–75, Cl. D61—1.
Van Den Hoed, Ruut, to The Rustler, Inc. Western style building. 237,606, 11–11–75, Cl. D13—1.
Vetter, Lee J., to King Radio Corp. Aircraft flight instrument. 237,594, 11–11–75, Cl. D10—67.
Voycall: *See*—
Wolf, Arnold, Buell, and Howe. 237,625.
Walton, Robert J.: *See*—
Kessler, Joseph V. 237,638.
Warren, Robert G., F. S. Stearns, and E. C. Whitcomb, to Rockwell International Corp. Multiple substrate holder. 237,565, 11–11–75, Cl. D6—28.
Weber, George H. Guide for golf putter. 237,633, 11–11–75, Cl. D34—5.

Wells, Charles A., to Pretty Products, Inc. Automobile floor mat. 237,605, 11–11–75, Cl. D12—203.
Welter, Kenneth F.: *See*—
Berger, Irvin E., and Welter. 237,600.
Wesco Industries Corp.: *See*—
Clemens, Robert W. 237,656.
Whitcomb, Eugene C.: *See*—
Warren, Robert G., Stearns, and Whitcomb. 237,565.
Widerby, Lennart: *See*—
Larkfeldt, Birger, and Widerby. 237,618.
Williams, Donald E., and F. E. Robertson, to Acra-Plant, Inc. Subsoil applicator. 237,644, 11–11–75, Cl. D39—1.
Wilson, Allen R.: *See*—
Stiffler, James W., and Wilson. 237,603.
Winnebago Industries, Inc.: *See*—
Jacobs, Jerry E. 237,598.
Wolf, Arnold, B. A. Buell, and W. E. Howe, to Voycall. Telephone intercommunicating unit. 237,625, 11–11–75, Cl. D26—14.
Yukimitsu, Shiro. Packaging container for bean curd or the like. 237,587, 11–11–75, Cl. D9—168.
Zimmers, Melvin: *See*—
Gerber, Gary A., and Zimmers. 237,563.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 11, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
161A 3,918,096
3,918,097
209 3,918,098

CLASS 3
1 3,918,099
1.9 3,918,100
1.911 3,918,101
1.912 3,918,102
22 3,918,103

CLASS 4
6 3,918,104
67A 3,918,105
120 3,918,106
172.17 3,918,107
185L 3,918,108

CLASS 5
113 3,918,109
348WB 3,918,110

CLASS 8
2.5 3,918,895
10.2 3,918,896
62 3,918,897
111 3,918,898
120 3,918,899
149.1 3,918,111
158 3,918,112
168 3,918,900
172 3,918,901
174 3,918,902
186 3,918,903

CLASS 9
8R 3,918,113
310R 3,918,114

CLASS 12
145 3,918,115

CLASS 13
9 3,919,454

CLASS 15
3.13 3,918,116
21D 3,918,117
83 3,918,118
328 3,918,119

CLASS 16
108 3,918,120
128 3,918,121
137 3,918,122

CLASS 17
11 3,918,123
43 3,918,124
45 3,918,125

CLASS 19
156.3 3,918,126
243 3,918,127
260 3,918,128

CLASS 21
60.5A 3,918,904

CLASS 23
230B 3,918,905
3,918,908
230R 3,918,906
3,918,907
253PC 3,918,911
253R 3,918,909
3,918,910
258.5B 3,918,912
259 3,918,913
259.5 3,918,914
262 3,918,915
273MT 3,918,916
283 3,918,917
288K 3,918,918
290 3,918,919
292 3,918,920
313AS 3,918,921

CLASS 24
16PB 3,918,129
73P 3,918,130
201C 3,918,131
241SL 3,918,132

CLASS 27
2 3,918,133

CLASS 28
72CS 3,918,135
72FT 3,918,134

CLASS 29
25.11 3,918,136
156.4WL 3,918,137
182.3 3,918,922
3,918,925
182.5 3,918,923
182.7 3,918,138
182.8 3,918,924
194 3,918,139
195 3,918,926
3,918,927
196.1 3,918,928
211R Re.28,608
271 3,918,140
419R 3,918,141
420 3,918,142
429 3,918,143
564 3,918,145
569 3,918,146
570 3,918,147
576 3,918,148
580 3,918,149
583 3,918,150
603 3,918,151
3,918,152
609 3,918,153

CLASS 30
34.2 3,918,154
47 3,918,155
151 3,918,156
287 3,918,157
314 3,918,158

CLASS 32
14D 3,918,159
19 3,918,160
22 3,918,161

CLASS 33
41R 3,918,162
142 3,918,163
143C 3,918,164
174G 3,918,165
179 3,918,166
185R 3,918,167

CLASS 34
11 3,918,168
15 3,918,169
58 3,918,170
243C 3,918,171

CLASS 35
9R 3,918,173
3,918,174
11 3,918,175
22R 3,918,176
31G 3,918,178
31R 3,918,177
35A 3,918,179
35E 3,918,180

CLASS 36
2.5A 3,918,181
68 3,918,182

CLASS 40
33 3,918,183
52R 3,918,184
106.53 3,918,185
129B 3,918,186
156 3,918,187
158R 3,918,188

CLASS 42
67 3,918,189

CLASS 43
4.5 3,918,190
17 3,918,191
42.17 3,918,192
43.1 3,918,193
61 3,918,194

CLASS 44
10K 3,918,929

CLASS 46
1R 3,918,195
29 3,918,196
81 3,918,197
206 3,918,198
247 3,918,199

CLASS 47
58 3,918,200

CLASS 48
214 3,918,930

CLASS 49
28 3,918,201
168 3,918,203
246 3,918,204
252 3,918,205
441 3,918,206
462 3,918,207

CLASS 51
5D 3,918,209
80A 3,918,210
157 3,918,211
163 3,918,212
170R 3,918,214
170T 3,918,213
178 3,918,215
283 3,918,216
295 3,918,217
298 3,918,218
307 3,918,219
309 3,918,931
328 3,918,220

CLASS 52
1 3,918,221
106 3,918,202
126 3,918,225
221 3,918,223
3,918,224
227 3,918,222
232 3,918,226
283 3,918,227
288 3,918,228
295 3,918,229
309 3,918,230
628 3,918,231
738 3,918,232
747 3,918,233
760 3,918,234

CLASS 53
28 3,918,235
29 3,918,236
133 3,918,237

CLASS 54
79 3,918,238

CLASS 55
16 3,918,933
48 3,918,934
62 3,918,932
85 3,918,935
97 3,918,936
3,918,937
148 3,918,938
155 3,918,939
223 3,918,940
230 3,918,941
337 3,918,943
3,918,944
350 3,918,945
385 3,918,942

CLASS 56
7 3,918,239
3,918,240
12.7 3,918,241
16.7 3,918,242
229 3,918,243

CLASS 57
6 3,918,244
58.54 3,918,245
58.91 3,918,246
101 3,918,248
140J 3,918,247

CLASS 58
12 3,918,249
23R 3,918,250
42.5 3,918,251
125C 3,918,252

CLASS 60
39.28R 3,918,253
3,918,254
39.65 3,918,255
221 3,918,256
284 3,918,257
305 3,918,258
445 3,918,259
500 3,918,260
506 3,918,261
517 3,918,262
614 3,918,263

CLASS 61
12 3,918,264

CLASS 62
54 3,918,265
137 3,918,266
138 3,918,267
150 3,918,268
180 3,918,269
239 3,918,270
285 3,918,271

CLASS 64
23 3,918,272

CLASS 65
1 3,918,946
3 3,918,947
25R 3,918,948
26 3,918,949
114 3,918,950
334 3,918,951

CLASS 66
9B 3,918,273
3,918,274
132 3,918,275

CLASS 68
18R 3,918,276
140 3,918,277

CLASS 70
58 3,918,278
234 3,918,279

CLASS 71
28 3,918,952
94 3,918,953
95 3,918,954

CLASS 72
22 3,918,280
38 3,918,281
39 3,918,282
52 3,918,283
77 3,918,285
97 3,918,284
213 3,918,286
246 3,918,287
439 3,918,289
467 3,918,288
481 3,918,290

CLASS 73
32A 3,918,292
40 3,918,291
49.3 3,918,293
67.2 3,918,294
67.7 3,918,295
3,918,296
3,918,297
71.6 3,918,298
91 3,918,299
112 3,918,300
141A 3,918,301
141R 3,918,302
190R 3,918,303
194A 3,918,304
211 3,918,305
226 3,919,455
304C 3,918,306
387 3,918,307
425.6 3,918,308

CLASS 74
5.34 3,918,309
5.6D 3,918,310
37 3,918,311
230.17F 3,918,312
393 3,918,313
459.5 3,918,314
462 3,918,315
469 3,918,317
473P 3,918,316
479 3,918,318
491 3,918,319
513 3,918,320
516 3,918,321
519 3,918,322
551.8 3,918,323
568FS 3,918,324
573 3,918,326
600 3,918,327
665F 3,918,328
687 3,918,325

CLASS 75
.5AA 3,918,955
3 3,918,956
10R 3,918,957
13 3,918,958
67R 3,918,959
68B 3,918,960
97A 3,918,961
117 3,918,962
130 3,918,963
171 3,918,964
172R 3,918,965

CLASS 81
3R 3,918,329
9.51 3,918,330

CLASS 82
2R 3,918,331
36R 3,918,332
3,918,333

CLASS 83
13 3,918,334
19 3,918,335
255 3,918,336
409 3,918,337
449 3,918,338
611 3,918,339
765 3,918,340

CLASS 84
1.01 3,918,341
3,918,342
376EA 3,918,343

CLASS 85
12 3,918,344
46 3,918,345

CLASS 89
37C 3,918,346
141 3,918,347

CLASS 90
11R 3,918,348

CLASS 91
5 3,918,349
48 3,918,350
418 3,918,351

CLASS 92
106 3,918,352

CLASS 93
37SP 3,918,353

CLASS 96
1LY 3,918,966
1PS 3,918,969
1SD 3,918,968
1M 3,918,967
1.2 3,918,970
1.4 3,918,971
48R 3,918,972
3,918,973
49 3,918,974
56.1 3,918,975
84R 3,918,976
86R 3,918,977
135 3,918,978
137 3,918,979

CLASS 98
40D 3,918,354

CLASS 99
283 3,918,355
452 3,918,356
646R 3,918,357

CLASS 100
19R 3,918,358
52 3,918,359
3,918,360

CLASS 101
91 3,918,361
115 3,918,362
183 3,918,363

CLASS 102
92.1 3,918,364
101 3,918,365

CLASS 104
1R 3,918,366
88 3,918,367
134 3,918,368

CLASS 105
164 3,918,369
416 3,918,370

CLASS 106
1 3,918,980
15AF 3,918,981
46 3,918,982
244 3,918,983
290 3,918,984
304 3,918,985

CLASS 109
64 3,918,371

CLASS 110
7R 3,918,372
8E 3,918,374
8R 3,918,373
14 3,918,375

CLASS 112
121.15 3,918,376

CLASS 113
120B 3,918,377
121C 3,918,378

CLASS 114
.5D 3,918,379
3,918,380
29 3,918,381
66.5R 3,918,382
102 3,918,383
219 3,918,384
230 3,918,385
3,918,386

CLASS 115
.5B 3,918,387
22.2 3,918,388
34B 3,918,389

CLASS 116
119 3,918,390
124L 3,918,391
124.4 3,918,392

CLASS 118
7 3,918,394
8 3,918,395
49.1 3,918,396
60 3,918,397
125 3,918,398
261 3,918,400
308 3,918,399
630 3,918,401
637 3,918,402
3,918,403

CLASS 119
28 3,918,404
52AF 3,918,405
96 3,918,406
156 3,918,407
157 3,918,408

CLASS 122
32 3,918,409
271 3,918,410
477 3,918,411

CLASS 123
3 3,918,412
8.07 3,918,413
8.27 3,918,414
8.45 3,918,415
3,918,416
32EA 3,918,417
41.08 3,918,418
75B 3,918,419
75C 3,918,420
122AC 3,918,422
3,918,423
3,918,424
122D 3,918,421
148E 3,918,425

CLASS 124
16 3,918,426
20B 3,918,427
41A 3,918,428

CLASS 125
11PH 3,918,429

CLASS 126
271 3,918,430
CLASS 127
29 3,918,986
CLASS 128
1B 3,918,432
1R 3,918,431
2A 3,918,434
2F 3,918,433
2W 3,918,435
2.05G 3,918,436
3,918,437
4 3,918,438
7 3,918,439
82.1 3,918,440
92BC 3,918,441
92G 3,918,442
130 3,918,443
3,918,444
3,918,445
133 3,918,446
145.8 3,918,447
146.6 3,918,448
218R 3,918,449
247 3,918,450
260 3,918,451
270 3,918,452
278 3,918,453
287 3,918,454
339 3,918,455
348 3,918,456
400 3,918,458
419P 3,918,460
419R 3,918,459
422 3,918,461
CLASS 131
170R 3,918,462
172 3,918,463
173 3,918,464
CLASS 132
37R 3,918,465
91 3,918,466
CLASS 134
64 3,918,467
95 3,918,987
CLASS 136
6LN 3,918,988
24 3,918,989
28 3,918,990
83R 3,918,991
3,918,992
89 Re.28,610
135S 3,918,993
145 3,918,994
3,918,995
CLASS 137
3 3,918,468
5 3,918,469
115 3,918,470
218 3,918,477
238 3,918,471
315 3,918,478
340 3,918,479
387 3,918,457
488 3,918,480
504 3,918,481
542 3,918,482
550 3,918,483
553 3,918,484
580 3,918,486
588 3,918,487
594 3,918,485
596.16 3,918,488
3,918,489
597 3,918,490
604 3,918,491
614.04 3,918,492
625.23 3,918,493
3,918,494
625.48 3,918,495
636.1 3,918,496
CLASS 138
30 3,918,497
31 3,918,498
125 3,918,499
CLASS 139
59 3,918,500
122H 3,918,501
CLASS 140
3CA 3,918,473
106 3,918,472
CLASS 141
98 3,918,474
128 3,918,475
CLASS 144
34E 3,918,476
CLASS 148
1.5 3,918,996
3,918,997
11.5R 3,918,998
12F 3,918,999
14 3,919,000
31.57 3,919,001
3,919,002
3,919,003
3,919,004
175 3,919,005
3,919,006
187 3,919,008
189 3,919,007
3,919,009
3,919,010
CLASS 149
19.4 3,919,011
19.5 3,919,012
19.8 3,919,013
36 3,919,014
42 3,919,015
60 3,919,016
CLASS 150
1 3,918,502
35 3,918,503
CLASS 151
5 3,918,208
CLASS 152
225 3,918,504
243 3,918,505
361R 3,918,506
379 3,918,507
381 3,918,508
CLASS 156
62.2 3,919,017
85 3,919,018
91 3,919,019
95 3,919,020
97 3,919,021
104 3,919,022
107 3,919,023
123 3,919,024
141 3,919,025
143 3,919,026
145 3,919,027
148 3,919,028
205 3,919,029
211 3,919,030
219 3,919,031
252 3,919,032
283 3,919,033
304 3,919,034
315 3,919,035
384 3,919,036
502 3,919,037
511 3,919,038
562 3,919,039
571 3,919,040
CLASS 157
1.24 3,918,509
CLASS 160
45 3,918,510
67 3,918,511
90 3,918,512
176 3,918,513
CLASS 162
25 3,919,041
175 3,919,042
CLASS 164
89 3,918,514
137 3,918,515
CLASS 165
5 3,918,516
10 3,918,517
122 3,918,518
CLASS 166
53 3,918,519
64 3,918,520
272 3,918,521
285 3,918,522
3,918,523
307 3,918,524
CLASS 169
10 3,918,525
51 3,918,526
CLASS 172
9 3,918,527
218 3,918,528
294 3,918,529
CLASS 173
1 3,918,530
10 3,918,531
105 3,918,532
155 3,918,533
162 3,918,534
3,918,535
CLASS 174
27 3,919,456
48 3,919,457
51 3,919,458
63 3,919,459
87 3,919,460
CLASS 175
85 3,918,536
320 3,918,537
410 3,918,538
CLASS 176
19R 3,919,043
CLASS 177
210 3,918,539
CLASS 178
2R 3,919,461
5.1 3,919,462
3,919,463
6 3,919,464
6.6R 3,919,465
6.8 3,919,466
3,919,467
7.1 3,919,468
3,919,469
3,919,470
3,919,471
7.2 3,919,472
3,919,473
3,919,474
7.91 3,919,475
68 3,919,476
CLASS 179
1GQ 3,919,477
3,919,478
3,919,480
1SA 3,919,481
1SB 3,919,479
15AL 3,919,483
3,919,484
15BF 3,919,485
15BT 3,919,482
16EA 3,919,486
17R 3,919,487
18HB 3,919,488
27G 3,919,489
37 3,919,490
41A 3,919,491
84R 3,919,492
3,919,493
90R 3,919,494
98 3,919,495
100C 3,919,497
100R 3,919,496
115A 3,919,500
115.5PV 3,919,498
3,919,499
156R 3,919,501
170D 3,919,502
175.2R 3,919,503
3,919,504
CLASS 180
44M 3,918,546
54A 3,918,547
69R 3,918,540
3,918,541
69.1 3,918,542
77R 3,918,543
79.2R 3,918,544
82C 3,918,545
117 3,918,548
CLASS 181
57 3,918,549
135 3,918,550
144 3,918,551
CLASS 187
29R 3,918,552
CLASS 188
1A 3,918,553
32 3,918,554
73.5 3,918,555
77R 3,918,556
CLASS 191
59.1 3,918,557
CLASS 192
3R 3,918,558
54 3,918,559
114T 3,918,560
CLASS 193
35A 3,918,561
CLASS 194
78 3,918,562
100A 3,918,563
3,918,564
3,918,565
102 3,918,566
CLASS 195
1.5 3,919,044
3 3,919,045
30 3,919,046
51R 3,919,047
63 3,919,048
66R 3,919,049
103.5R 3,919,050
3,919,051
115 3,919,052
139 3,919,053
CLASS 197
1R 3,918,567
49 3,918,568
168 3,918,569
CLASS 198
19 3,918,570
25 3,918,571
66 3,918,572
165 3,918,573
203 3,918,574
284 3,918,575
CLASS 200
5R 3,919,505
16A 3,919,506
50A 3,919,507
61.58B 3,919,508
61.62 3,919,509
61.88 3,919,510
148R 3,919,511
153SC 3,919,512
256 3,919,513
331 3,919,514
CLASS 203
6 3,919,054
CLASS 204
38B 3,919,055
55R 3,919,056
59F 3,919,057
67 3,919,058
120 3,919,059
129.3 3,919,060
129.6 3,919,061
149 3,919,062
159.15 3,919,063
176 3,919,064
180G 3,919,065
192 3,919,066
195P 3,919,067
197 3,919,068
206 3,919,069
222 3,919,070
286 3,919,071
CLASS 206
44 3,918,576
45.34 3,918,577
204 3,918,578
306 3,918,579
320 3,918,580
334 3,918,581
362 3,918,582
491 3,918,583
497 3,918,584
CLASS 208
4 3,919,072
47 3,919,073
48R 3,919,074
180 3,919,075
3,919,076
251R 3,919,077
313 3,919,078
CLASS 209
3 3,918,585
74R 3,918,586
121 3,918,587
166 3,919,079
167 3,919,080
CLASS 210
23 3,919,081
31C 3,919,082
54 3,919,083
73 3,919,084
83 3,919,085
197 3,919,086
350 3,919,087
402 3,919,088
445 3,919,089
523 3,919,090
CLASS 211
49 3,918,588
57 3,918,589
176 3,918,590
178R 3,918,591
CLASS 212
8R 3,918,592
CLASS 214
1BH 3,918,593
1Q Re.28,609
1.5 3,918,594
6B 3,918,595
75R 3,918,596
152 3,918,597
3,918,598
454 3,918,599
750 3,918,600
776 3,918,601
CLASS 215
219 3,918,602
CLASS 219
69E 3,919,515
3,919,516
73 3,919,517
80 3,919,518
137 3,919,519
208 3,919,520
238 3,919,524
267 3,919,521
268 3,919,522
271 3,919,525
494 3,919,523
CLASS 220
1R 3,918,603
22 3,918,604
63R 3,918,605
208 3,918,606
CLASS 221
15 3,918,607
63 3,918,608
CLASS 222
61 3,918,609
144.5 3,918,612
148 3,918,613
153 3,918,614
396 3,918,611
397 3,918,610
402.13 3,918,615
504 3,918,616
536 3,918,617
CLASS 224
45L 3,918,618
CLASS 227
8 3,918,619
9 3,918,620
10 3,918,621
CLASS 228
8 3,918,622
112 3,918,624
127 3,918,623
136 3,918,625
147 3,918,626
178 3,918,627
205 3,918,144
213 3,918,628
CLASS 229
21 3,918,629
35 3,918,630
37 3,918,631
69 3,918,632
CLASS 234
79 3,918,633
CLASS 235
1C 3,918,634
51 3,919,544
61.11A 3,919,528
61.11E 3,919,527
61.6A 3,919,526
89R 3,918,635
150.27 3,919,529
151.3 3,919,530
3,919,531
153AC 3,919,533
156 3,919,532
3,919,534
164 3,919,535
174 3,919,536
183 3,919,537
CLASS 236
78 3,918,636
CLASS 237
12.3C 3,918,637
CLASS 238
14 3,918,638
CLASS 239
1 3,918,639
4 3,918,640
15 3,918,641
230 3,918,642
3,918,643
243 3,918,644
271 3,918,646
428.5 3,918,647
498 3,918,645
CLASS 240
1.3 3,919,538
3,919,539
2R 3,919,540
6.46 3,919,541
41.55 3,919,542
46.01 3,919,543
CLASS 241
32 3,918,648
189R 3,918,649
CLASS 242
25R 3,918,650
35.6R 3,918,651
46.4 3,918,652
54R 3,918,653
55.2 3,918,661
56R 3,918,654
58.1 3,918,655
67.1R 3,918,656
84.8 3,918,657
107.4 3,918,658
110.1 3,918,659
204 3,918,660
CLASS 244
3.28 3,918,664
77A 3,918,662
153R 3,918,663
CLASS 246
415 3,918,665
CLASS 248
4 3,918,666
56 3,918,667
205A 3,918,668
206R 3,918,669
214 3,918,670
285 3,918,671
447 3,918,672
CLASS 249
43 3,918,673
CLASS 250
201 3,919,545
205 3,919,546
253 3,919,547
277 3,919,548
310 3,919,549
311 3,919,550
3,919,553
328 3,919,554
332 3,919,555
358 3,919,551
360 3,919,552
366 3,919,556
3,919,557
443 3,919,558
508 3,919,559
557 3,919,560
561 3,919,561
570 3,919,562
CLASS 251
5 3,918,674
6 3,918,675
51 3,918,676
61.1 3,918,677
144 3,918,678
149.1 3,918,679
287 3,918,680
317 3,918,681
CLASS 252
8.55D 3,919,092
8.8 3,919,091
31 3,919,093
33 3,919,094
46.6 3,919,095
46.7 3,919,096
48.6 3,919,097
59 3,919,098
63.2 3,919,099
79.1 3,919,100
90 3,919,101
99 3,919,102
3,919,107
187C 3,919,103
188.3R 3,919,104
299 3,919,105
3,919,106
301.3R 3,919,108
301.6P 3,919,109
316 3,919,110
321 3,919,111
352 3,919,112
373 3,919,113
3,919,114
417 3,919,115
437 3,919,116
448 3,919,117
461 3,919,119
466PT 3,919,121
466B 3,919,120
512 3,919,122
518 3,919,123
520 3,919,124
551 3,919,125
CLASS 254
87 3,918,682
93R 3,918,683
131 3,918,684
134.3PA 3,918,685
CLASS 256
59 3,918,686
CLASS 259
4 3,918,687
3,918,688
105 3,918,689
191 3,918,690
CLASS 260
2.1E 3,919,126
2.5AW 3,919,128
2.5F 3,919,127
4 3,919,130
5 3,919,131
3,919,132
3,919,133
7 3,919,134
9 3,919,136
17A 3,919,137
3,919,140
17R 3,919,138
3,919,139
17.2 3,919,141
18PN 3,919,142

18R 3,919,143
20 3,919,144
22TN 3,919,145
23EP 3,919,146
26 3,919,147
28.5AS 3,919,148
28.5AV 3,919,149
28.5R 3,919,150
29.3 3,919,151
29.4UA 3,919,152
3,919,153
3,919,154
29.6TA 3,919,156
29.7T 3,919,157
30.6R 3,919,158
31.2R 3,919,159
32.8A 3,919,160
37SB 3,919,161
38 3,919,162
40R 3,919,163
42 3,919,164
45.75K 3,919,165
45.75S 3,919,168
45.8A 3,919,166
45.8N 3,919,167
47CB 3,919,170
47EP 3,919,169
48 3,919,171
73L 3,919,135
75R 3,919,172
77.5AB 3,919,174
77.5AT 3,919,173
78L 3,919,175
78.4D 3,919,176
79.1 3,919,177
79.3R 3,919,178
79.5C 3,919,179
80.7 3,919,180
80.78 3,919,181
85.5R 3,919,182
3,919,227
86.1R 3,919,183
87.5R 3,919,184
93.7 3,919,185
112R 3,919,186
125 3,919,187
158 3,919,188
209R 3,919,189
210AB 3,919,190
210.5 3,919,191
211.5R 3,919,192
3,919,193
3,919,194
239A 3,919,195
239.1 3,919,196
239.3A 3,919,197
239.55 3,919,198
239.57 3,919,199
240A 3,919,200
240F 3,919,202
240J 3,919,201
240R 3,919,203
243C 3,919,204
3,919,205
3,919,206
3,919,207
3,919,208
3,919,209
244A 3,919,210
246B 3,919,211
3,919,212
3,919,213
248AS 3,919,214
3,919,215
3,919,216
3,919,219
3,919,220
248NS 3,919,218
248C 3,919,217
249.5 3,919,221
249.8 3,919,222
250QN 3,919,224
250Q 3,919,223
251R 3,919,225
252 3,919,226
256.4N 3,919,228
3,919,229
3,919,230
256.4R 3,919,231
257 3,919,232
268TR 3,919,234
268C 3,919,233
270PD 3,919,235
283R 3,919,236
285 3,919,237
288CE 3,919,239
288CF 3,919,238
293.53 3,919,240
3,919,241
293.58 3,919,242
293.67 3,919,243
294.8C 3,919,244
294.8F 3,919,245
294.9 3,919,246
295B 3,919,247
295F 3,919,248
302E 3,919,129
340.7 3,919,249
340.9 3,919,250
3,919,251
3,919,252
343.3 3,919,253
343.6 3,919,254
343.9 3,919,255
345.9 3,919,256
346.8R 3,919,258
346.8 3,919,257
3,919,259
347.4 3,919,260
347.5 3,919,261
348C 3,919,262
385 3,919,263
3,919,264
396R 3,919,265
397.1 3,919,266
397.3 3,919,267
397.4 3,919,268
404.5 3,919,269
3,919,270
409 3,919,271
410.9R 3,919,272
429.1 3,919,273
3,919,274
430 3,919,277
438.1 3,919,275
448.2E 3,919,276
453P 3,919,278
3,919,279
3,919,280
455B 3,919,281
456A 3,919,282
458 3,919,283
465.4 3,919,284
468D 3,919,285
3,919,286
3,919,287
475P 3,919,288
479C 3,919,289
481R 3,919,290
482C 3,919,291
486H 3,919,292
488R 3,919,293
491 3,919,294
501.14 3,919,295
502.5 3,919,296
3,919,297
503 3,919,298
3,919,299
513R 3,919,300
513.7 3,919,301
514D 3,919,302
517 3,919,303
520 3,919,304
523A 3,919,305
524R 3,919,306
541 3,919,307
543R 3,919,308
545R 3,919,309
551S 3,919,310
552R 3,919,311
554 3,919,312
558A 3,919,313
562R 3,919,314
564RF 3,919,315
566A 3,919,318
566R 3,919,317
567.6M 3,919,319
571 3,919,155
578 3,919,316
583R 3,919,320
590 3,919,321
3,919,322
592 3,919,323
602 3,919,324
606.5P 3,919,325
610R 3,919,326
613R 3,919,327
615A 3,919,328
3,919,329
619R 3,919,330
623R 3,919,331
624R 3,919,332
3,919,333
629 3,919,334
651R 3,919,335
656R 3,919,336
658R 3,919,337
660 3,919,338
672R 3,919,339
683.2 3,919,340
3,919,341
683.42 3,919,342
683.48 3,919,343
825 3,919,344
830R 3,919,345
836 3,919,346
3,919,347
837R 3,919,348
3,919,349
850 3,919,350
3,919,351
856 3,919,352
873 3,919,353
880R 3,919,354
3,919,355
891 3,919,356
895 3,919,357
897A 3,919,358
942 3,919,359
943 3,919,360
953 3,919,361
964 3,919,362
973 3,919,363
3,919,364
CLASS 261
41C 3,919,365
50A 3,919,366
CLASS 264
40 3,919,367
45.1 3,919,368
3,919,369
45.4 3,919,370
46.6 3,919,371
82 3,919,372
89 3,919,373
90 3,919,374
99 3,919,375
102 3,919,376
147 3,919,377
164 3,919,378
3,919,379
3,919,380
3,919,381
3,919,382
176F 3,919,383
177R 3,919,384
184 3,919,385
255 3,919,386
344 3,919,387
CLASS 266
16 3,918,691
35 3,918,692
CLASS 267
64R 3,918,693
CLASS 269
47 3,918,694
87.2 3,918,695
287 3,918,696
289 3,918,697
CLASS 270
69 3,918,698
3,918,699
CLASS 271
64 3,918,700
174 3,918,702
181 3,918,701
185 3,918,703
201 3,918,704
243 3,918,705
250 3,918,706
277 3,918,707
CLASS 272
8R 3,918,708
81 3,918,710
85 3,918,709
CLASS 273
29A 3,918,711
58C 3,918,712
73A 3,918,713
101.1 3,918,714
131AB 3,918,715
138A 3,918,716
138R 3,918,717
162D 3,918,718
176R 3,918,719
183C 3,918,720
186A 3,918,721
CLASS 274
23R 3,918,722
37 3,918,723
CLASS 277
9 3,918,724
167.5 3,918,725
227 3,918,726
CLASS 279
50 3,918,727
CLASS 280
11.13B 3,918,730
11.13E 3,918,728
11.13L 3,918,731
11.3 3,918,729
11.35K 3,918,732
35 3,918,733
36B 3,918,734
36C 3,918,735
104.5R 3,918,736
124B 3,918,737
3,918,739
124R 3,918,738
150C 3,918,740
150.5 3,918,741
3,918,742
293 3,918,743
415B 3,918,744
457 3,918,745
477 3,918,746
CLASS 285
4 3,918,747
21 3,918,748
256 3,918,749
CLASS 292
106 3,918,750
126 3,918,751
174 3,918,752
216 3,918,753
224 3,918,754
256 3,918,755
CLASS 294
31.2 3,918,756
50.9 3,918,757
83R 3,918,758
CLASS 296
28B 3,918,759
CLASS 297
384 3,918,760
CLASS 299
5 3,918,761
CLASS 301
37AT 3,918,764
37P 3,918,762
37R 3,918,763
CLASS 303
6R 3,918,765
21A 3,918,767
21F 3,918,768
21P 3,918,766
66 3,918,769
CLASS 307
119 3,919,563
218 3,919,564
235R 3,919,565
3,919,566
254 3,919,567
296 3,919,568
304 3,919,569
CLASS 308
2A 3,918,771
2R 3,918,770
4R 3,918,772
10 3,918,773
187 3,918,774
193 3,918,775
194 3,918,776
201 3,918,777
3,918,778
236 3,918,779
CLASS 310
8.7 3,919,570
40 3,919,571
45 3,919,572
50 3,919,573
68 3,919,574
81 3,919,575
207 3,919,576
CLASS 312
30 3,918,780
111 3,918,781
204 3,918,782
CLASS 313
201 3,919,577
222 3,919,578
273 3,919,579
310 3,919,580
345 3,919,581
383 3,919,582
448 3,919,583
473 3,919,584
499 3,919,585
CLASS 315
8 3,919,586
12 3,919,587
14 3,919,588
71 3,919,589
101 3,919,590
169TV 3,919,591
199 3,919,592
241P 3,919,593
3,919,594
257 3,919,595
294 3,919,596
382 3,919,597
385 3,919,598
387 3,919,599
CLASS 317
13R 3,919,600
31 3,919,601
101C 3,919,602
121 3,919,603
230 3,919,604
254 Re.28,611
262A 3,919,605
CLASS 318
128 3,919,606
135 3,919,607
138 3,919,608
227 3,919,609
231 3,919,610
380 3,919,611
443 3,919,613
571 3,919,614
CLASS 320
2 3,919,615
35 3,919,616
39 3,919,617
3,919,618
CLASS 321
5 3,919,619
13 3,919,620
14 3,919,621
45C 3,919,622
3,919,624
CLASS 322
15 3,919,623
CLASS 323
17 3,919,625
93 3,919,626
CLASS 324
30R 3,919,627
37 3,919,628
41 3,919,629
43R 3,919,630
51 3,919,631
54 3,919,635
72 3,919,636
73R 3,919,637
95 3,919,638
125 3,919,632
126 3,919,633
158R 3,919,639
163 3,919,634
CLASS 325
30 3,919,640
38R 3,919,641
113 3,919,642
150 3,919,643
174 3,919,644
316 3,919,645
470 3,919,646
CLASS 328
155 3,919,647
167 3,919,648
186 3,919,649
CLASS 329
102 3,919,650
104 3,919,651
3,919,652
3,919,653
CLASS 330
29 3,919,654
30D 3,919,655
51 3,919,656
3,919,657
69 3,919,658
86 3,919,659
185 3,919,660
CLASS 331
65 3,919,661
94.5C 3,919,663
3,919,664
3,919,665
94.5G 3,919,662
96 3,919,666
3,919,667
130 3,919,668
CLASS 333
24.2 3,919,673
30R 3,919,669
31A 3,919,670
70R 3,919,671
82BT 3,919,672
CLASS 335
20 3,919,674
160 3,919,675
179 3,919,676
216 3,919,677
296 3,919,678
CLASS 337
107 3,919,679
CLASS 338
28 3,919,680
119 3,919,681
262 3,919,682
CLASS 339
17LC 3,918,783
17C 3,918,784
18R 3,918,785
19 3,918,786
3,918,787
3,918,788
245 3,918,789
257 3,918,790
CLASS 340
1R 3,919,683
8R 3,919,684
15.5GC 3,919,685
24 3,919,686
27NA 3,919,687
62 3,919,688
3,919,689
146.1BA 3,919,690
172.5 Re.28,612
3,919,691
3,919,692
3,919,693
3,919,694
3,919,695
3,919,696
173CA 3,919,699
173LM 3,919,698
173MS 3,919,700
173R 3,919,697
174TF 3,919,701
237S 3,919,702
253R 3,919,703
280 3,919,704
3,919,705
347AD 3,919,706
CLASS 343
5DP 3,919,707
6.5R 3,919,708
770 3,919,710
CLASS 350
42 3,918,791
76 3,918,792
91 3,918,793
96C 3,918,794
103 3,918,795
160LC 3,918,796
186 3,918,797
3,918,798
288 3,918,799
319 3,918,800
CLASS 352
72 3,918,801
3,918,802
CLASS 353
121 3,918,803
CLASS 355
3R 3,918,804
8 3,918,805
3,918,806
15 3,918,807
3,918,808
3,918,809
18 3,918,810
CLASS 356
4 3,918,172
51 3,918,811
73 3,918,812
153 3,918,813
156 3,918,814
157 3,918,815
167 3,918,816
208 3,918,817
239 3,918,818
CLASS 357
23 3,919,711
65 3,919,709
CLASS 358
27 3,919,712
32 3,919,713
38 3,919,714
CLASS 360
6 3,919,715
9 3,919,716
122 3,919,717
131 3,919,718
134 3,919,719
CLASS 401
57 3,918,819
152 3,918,820
CLASS 403
57 3,918,821
62 3,918,822
343 3,918,823
CLASS 404
64 3,918,824
CLASS 408
43 3,918,825
154 3,918,826
CLASS 415
5 3,918,827
61 3,918,828
119 3,918,829
122 3,918,830
131 3,918,831
217 3,918,832
CLASS 416
20 3,918,833
95 3,918,835
136 3,918,836
157 3,918,837
175 3,918,839
176 3,918,838
183 3,918,841
190 3,918,840
219 3,918,842

CLASS 417	
12	3,918,843
229	3,918,844
260	3,918,845
269	3,918,846
288	3,918,847
292	3,918,848
313	3,918,849
363	3,918,850
364	3,918,851
424	3,918,852
462	3,918,853
477	3,918,854
CLASS 418	
24	3,918,855
61B	3,918,856
73	3,918,857
142	3,918,858
187	3,918,859
191	3,918,860
CLASS 423	
69	3,919,388
210	3,919,389
210.5	3,919,390
240	3,919,391
	3,919,392
242	3,919,393
	3,919,394
309	3,919,395
321	3,919,396
405	3,919,397
461	3,919,118
481	3,919,398
488	3,919,399
502	3,919,400
520	3,919,401
522	3,919,402
628	3,919,403
633	3,919,404
646	3,919,405
648	3,919,406
CLASS 424	
12	3,919,407
49	3,919,408
52	3,919,409
78	3,919,410
81	3,919,411
89	3,919,412
	3,919,413
94	3,919,414
115	3,919,415
162	3,919,416
184	3,919,417
216	3,919,418
219	3,919,419
240	3,919,420
241	3,919,421
246	3,919,422
250	3,919,423
251	3,919,425
	3,919,426
254	3,919,427
270	3,919,428
316	3,919,424
358	3,919,429
365	3,919,430
CLASS 425	
47	3,918,861
114	3,918,862
117	3,918,863
129R	3,918,864
131.1	3,918,865
136	3,918,866
169	3,918,868
174	3,918,867
190	3,918,869
251	3,918,870
292	3,918,871
308	3,918,872
345	3,918,873
381	3,918,874
384	3,918,875
389	3,918,876
443	3,918,877
CLASS 426	
190	3,919,431
319	3,919,432
320	3,919,433
553	3,919,434
574	3,919,435
CLASS 427	
3	3,919,436
13	3,919,437
38	3,918,393
54	3,919,438
341	3,919,439
CLASS 428	
35	3,919,440
81	3,919,443
95	3,919,444
116	3,919,445
	3,919,446
138	3,919,447
157	3,919,448
245	3,919,449
307	3,919,450
310	3,919,451
325	3,919,452
336	3,919,453
426	3,919,441
494	3,919,442
CLASS 431	
6	3,918,878
8	3,918,879
10	3,918,834
22	3,918,880
46	3,918,881
92	3,918,882
93	3,918,883
95A	3,918,884
182	3,918,885
184	3,918,886
255	3,918,887
297	3,918,888
346	3,918,889
CLASS 432	
18	3,918,891
36	3,918,892
54	3,918,890
103	3,918,893
137	3,918,894
CLASS 444	
1	3,919,720

CLASSIFICATION OF DESIGNS

D2—	228	237,557
	259	237,558
	264	237,559
		237,560
	314	237,562
	400	237,561
D6—	27	237,563
		237,564
	28	237,565
	47	237,566
	179	237,567
	182	237,568
	186	237,571
	194	237,572
		237,573
	203	237,569
D7—	6	237,574
	20	237,575
	53	237,576
	54	237,577
	60	237,570
	64	237,585
	94	237,578
	137	237,579
	212	237,580
D8—	18	237,581
	75	237,582
D9—	18	237,583
	54	237,584
	118	237,586
	168	237,587
		237,588
	178	237,589
	185	237,590
	222	237,591
	254	237,592
D10—	6	237,593
	67	237,594
	72	237,595
	75	237,596
D12—	25	237,597
	98	237,598
	105	237,599
	114	237,600
	116	237,601
	142	237,602
	147	237,603
	157	237,604
	203	237,605
D13—	1A	237,607
	B	237,606
D19—	60	237,608
	64	237,609
	73	237,610
D22—	14	237,611
	27	237,612
D23—	25	237,613
		237,614
		237,615
	55	237,616
	58	237,617
	141	237,618
	150	237,619
		237,620
D26—	1D	237,621
	5C	237,622
	14A	237,625
	B	237,623
		237,624
		237,626
	F	237,627
D28—	1C	237,628
D30—	99	237,629
D31—	22	237,630
D32—	1R	237,631
	2B	237,632
D34—	5BC	237,636
	CB	237,633
	DD	237,637
	DT	237,635
	J	237,638
	K	237,634
	14B	237,639
	15AJ	237,641
	M	237,640
		237,642
D35—	3A	237,643
D39—	1R	237,644
D40—	E	237,645
		237,646
D47—	6	237,647
D48—	32R	237,648
D55—	1G	237,649
D61—	F	237,650
	Q	237,651
		237,652
D64—	11B	237,653
D83—	1S	237,654
	12A	237,655
D92—	15	237,656

CLASSIFICATION OF PLANTS

P. —	14	3,804
P. —	20	3,803
P. —	22	3,802
P. —	50	3,801

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

	3,918,288		3,918,380		3,919,036		3,918,598	11	:	3,918,794	3,918,259
	3,918,526		3,918,388		3,919,098		3,918,823			3,919,642	3,918,328
	3,919,243		3,918,398		3,919,104		3,918,989	12	:	3,918,097	3,918,393
1	: 3,918,268		3,918,444		3,919,118		3,919,092			3,918,116	3,918,401
	3,918,414		3,918,462		3,919,148		3,919,273			3,918,132	3,918,408
	3,919,042		3,918,463		3,919,172		3,919,274			3,918,543	3,918,435
4	: 3,918,119		3,918,470		3,919,189		3,919,618			3,918,569	3,918,450
	3,918,404		3,918,477		3,919,192		3,919,710			3,918,616	3,918,453
	3,918,778		3,918,485		3,919,193	9	: 3,918,117			3,918,617	3,918,456
	3,918,828		3,918,503		3,919,317		3,918,139			3,918,622	3,918,570
	3,918,956		3,918,520		3,919,318		3,918,167			3,918,642	3,918,576
	3,919,433		3,918,542		3,919,329		3,918,168			3,918,686	3,918,577
	3,919,461		3,918,549		3,919,339		3,918,252			3,918,757	3,918,589
	3,919,529		3,918,550		3,919,395		3,918,313			3,918,764	3,918,601
	3,919,566		3,918,582		3,919,402		3,918,355			3,918,925	3,918,611
	3,919,621		3,918,607		3,919,404		3,918,465			3,918,950	3,918,613
5	: 3,918,596		3,918,618		3,919,418		3,918,614			3,918,964	3,918,626
6	: 3,918,098		3,918,639		3,919,432		3,918,631			3,918,980	3,918,635
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31 : 237,632
33 : 237,621
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42 : 237,606
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48 : 237,583
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53 : 237,612
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